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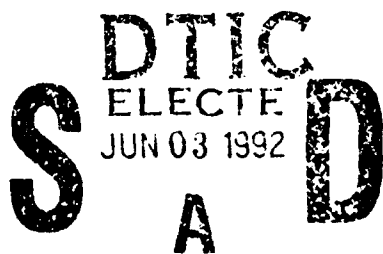


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# Distance Education Findings for Army Applications



Robert G. Pishel, Jr., Ph.D.



## Technical Memorandum

DEPARTMENT OF THE ARMY

April 1992

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## **Technical Memorandum**

**DEPARTMENT OF THE ARMY  
TRADOC Analysis Command  
White Sands Missile Range**

**April 1992**

**Prepared by:**



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Director  
USATRAC-WSMR**

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## DISTANCE EDUCATION FINDINGS FOR ARMY APPLICATIONS

### Introduction

The purpose of this report is to review recent distance education literature which pertains to potential success/failure results in Army programs which use distance education modalities. The emphasis was beyond correspondence courses and sought results of studies related to television/audio and/or computer combinations that have provided training away (distant) from the classroom. The Army refers to these approaches as distributed training. According to the TRADOC LONG RANGE TRAINING PLAN, the Army definition of distributed training is taking training to soldiers and units when and where they need it for both the Active (AC) and Reserve (RC) Components. The key objective is to centralize the development and decentralize the delivery of training. Supportive to this objective are nine strategic goals:

- A. Both the AC and RC should have equitable training throughout the Total Force.
- B. There should be access to learning facilities and information services.
- C. Networking for training delivery should be provided.
- D. There should first be distributed training for cognitive tasks and resident courses for hands-on performance of wartime tasks, and later, distributed training for hands-on tasks in areas of maintenance and equipment operation.
- E. Course designs should make use of appropriate media mix where the best medium is used for specific lessons.
- F. Distributed training programs should be evaluated to ensure training and cost effectiveness.
- G. Critical updates should be provided via electronic media.
- H. Resource allocations should maximize quality and quantity of training.
- I. The process should be an evolutionary rather than revolutionary transition.

Five basic distributed training means of delivery for the Army include:

- A. Print - paper based instruction
- B. Video Tape - a mode that provides both standardization and opportunity for repetitive viewing
- C. Computer-Based Training (CBT):
  1. Computer-Assisted Instruction (CAI) - the interaction between student and the computer training system which allows increased proficiency through practice

2. Computer-Managed Instruction (CMI) - to offer both prescriptive and diagnostic guidance

- D. Interactive Videodisc (IVD) - This media offers the realism of video combined with the power of microcomputer instruction, skills reinforcement, and perceived achievement enhancement.
- E. Video Teletraining - This media is capable of world-wide, one-way video (instructor to student) as well as two-way audio communications.

According to the TRADOC LONG RANGE TRAINING PLAN, about 99 percent of media usage in 1989 was via print, whereas it is estimated that by the year 2007, print will fall to about 10 percent and other media will be used as follows:

- A. Videotape - 20 percent
- B. CBT - 25 percent
- C. IVD - 15 percent
- D. Televideo - 30 percent

Given these prospects for technological applications to deliver training, a literature search was undertaken which could focus on pertinent recent distance education findings. These findings were to provide information, lessons learned, cautions, and possible directions/suggested actions that could be useful to the Army. The search procedure consisted of data bases from the Educational Resources Information Center (ERIC) (1982 - 1990) and the Defense Technical Information Center (DTIC) (1970 - 1990) in addition to the articles contained in The American Journal of Distance Education which began publishing in 1987.

This report presents findings from books (4), conferences (5), and articles (57) considered relevant to Army needs. For each of these three composition divisions, an annotated bibliography (appendix A) with ratings of content value has been developed. The content value was determined on the basis of two criteria:

- A. Relevance to Army needs, especially as related to Army distributed training study domains
- B. Empirical data and accompanying analysis, i.e., statistical results.

For example, a rating of A was assigned when the publication contents/issues were clearly relevant and empirical data/analyses were presented. B ratings were given when relevance was clear, but empirical data were absent. C ratings were given when marginal relevance existed, regardless of empirical data/analysis presentation.



Some publications were reviewed and not reported because they were not thought to be relevant to this project, while other relevant publications may exist but were not found in the time available for the search review.

The books, conferences, and articles that are included in this report are numbered sequentially in the appendix to aid in cross-referencing. The appendix references cited in the report are designated parenthetically with (Ref.). Books are preceded with (B-), conferences with (C-), and articles with (Art-). For example, the first cited publication is a book by Zigerrel (1991) and can be found under Books in the Appendix as B-4. Thus, in the text it is referenced as (Ref. B-4).

#### SCOPE:

This report first reviews findings related to the medium of television in distance education. Next, overviews of distance education evaluation results, course design, and cost findings are presented. Then, distance education evaluation approaches are identified. These findings are followed by literature results related to individual and/or psychological factors that can influence course success. Numerous specific actions to help improve distance education student performance and course completion are presented. Conclusions believed particularly relevant to the Army are then derived.

## I. The Medium of Television in Distance Education

### STRENGTHS AND WEAKNESSES OF THE TELEVISION MEDIUM:

Zigerell (1991) (Ref. B-4) says television may not display some illustrations/graphics requiring wide eye span and can encourage learner passivity if non-interactive or only one-way video is presented. Still, television is an effective instructional medium because of six positive features:

- A. Everyone has the best seat in the house.
- B. It enlarges the smallest objects.
- C. It is a window on the world.
- D. It brings remote places directly to the student.
- E. It never tires.
- F. It repeats processes and sequences on command for understanding.

Furthermore, video technology can attack major instructional problems by:

- A. Encouraging students to express abstract concepts
- B. Motivating students to learn actively
- C. Adapting instruction to student differences
- D. Encouraging mastery of generic skills, e.g., critical and inferential thinking
- E. Finding materials to use in improving faculty skills

Dillon (1989) (Ref. C-4,9) reviews instructional telecommunications from the faculty viewpoint. His research indicated telecourse advantages for the participant include:

- A. Seeing top names in the field
- B. Seeing concrete examples of abstract concepts
- C. Allowability to review programs more than once
- D. Getting a variety of viewpoints

Major disadvantages cited include:

- A. Lack of interaction - both student/teacher and student/student
- B. Too little feedback and discussion

Rupinski (1990) (Ref. Art-46) indicates video teletraining (VTT) produces only small results differences relative to traditional training. He also identified that there is a need for instructor training in VTT and that three deficiencies need to be overcome to augment effectiveness. These deficiencies are video quality, audio quality, and instructor to student interaction.

In the Third Annual Conference on Teaching at a Distance, Marder (1987) (Ref. C-2,2) reported that research data suggest seven guidelines to do effective video teleconferencing (VT):

- A. VT requires planning and delivery akin to the medium.
- B. VT transmission should rarely be for more than half a day.
- C. Presenters should be skilled in TV and audience interaction.
- D. VT may not be applicable to all subjects/situations.
- E. A support workbook should be provided before and after the video.
- F. Pace and timing with interaction should be controlled at the local site.
- G. Good technical quality for TV screen and audio is essential.

In the Fourth Annual Conference, DeGraff (1988) (Ref. C-3,II) reported on Satellite education and provided some pro's and con's of it relative to the Domino's Pizza Corp. The pro's include:

- A. A showcase of successful examples can be shown.
- B. Everyone can see a uniform message.
- C. Savings in travel and training time may be gained.
- D. Support of what you do and how you do it can be shown.

The major con's relate to the need for actual participation to achieve results and the need for the appropriate tools that must be used.

In the same conference (1988), Baird (Ref. C-3,1) suggests four strategies related to teleconference participant effectiveness and satisfaction:

- A. Humanizing with emphasis on the individual and overcoming any sense of distance by group rapport
- B. Provide for participation/allow interaction
- C. Messages should be received, understood, and remembered
- D. Provide feedback opportunities

#### VALUES OF INTERACTIVE LASERDISC SYSTEMS:

In the Fifth Annual Conference on Teaching at a Distance, Lookatch (1989) (Ref. C-4,20) discusses interactive laserdisc systems and identifies four unique instructional features they provide:

- A. Material can be paced to individual or group needs.
- B. Trials/simulations can provide immediate feedback.
- C. Testing of comprehension in various contexts can be achieved.
- D. Remedial activities can be provided.

Lookatch also cites the Bosco (1986) review of 28 studies. This review indicated the value on a statistical basis for interactive laserdisc-based instruction over other methods. A review of 30 studies by DeBloois (1988) indicated this technology produced at least as much learning as traditional approaches.

#### TELECONFERENCING EFFECTIVENESS EVALUATIONS:

Heinzen (1990) (Ref. Art-24) examined teleconference strengths and weaknesses. He developed an instrument and applied it in a pre-post test design. It makes use of items to evaluate diverse teleconferences as a function of the Amabile (1983) creativity model. The model components include: task motivation, domain relevant skills, and creativity relevant skills. Heinzen showed that teleconferencing appears to be an effective tool for:

- A. Motivation improvement
- B. Skills development
- C. Communications improvement

However, results did indicate that participants were disappointed in the use of teleconferencing as a problem solving tool.

Lasser (1981) (Ref. Art-35) studied efficiency of video as an additional teaching aid for a statistics course. Results of a comprehensive test indicated that all three test groups, which were supported by video in their textual treatment, obtained higher average point scores than those without video support.

#### SUMMARY:

Television can be an effective instructional medium and provide participants with advantages where interaction and feedback are given. Interactive laserdisc systems also provide unique instructional features and serve to produce at least as much learning as traditional methods. Teleconferencing is also effective with the noted exception of its use as a problem solving tool.

## II. Overview of Distance Education Evaluation Results

In his book, *The Uses of Television in American Higher Education*, Zigerell (1991) (Ref. B-4) indicated that the "results of most studies comparing TV student and classroom student performance show no significant differences". In Dirr's contribution to the Third Annual Conference on Teaching at a Distance (1987) (Ref. C-2,III), he stated that "there are over 300 studies spanning a 30-year period that conclude telecourses are at least as effective as traditional courses." Ritchie (1989) (Ref. Art-44) echoed this in his article about Live Television Instruction saying, "that studies for three decades have shown student performance across instructional approaches are similar."

Wagner conducted a study (Ref. C-2,6) with Instructional Television Fixed Service (ITFS) course students which was also reported in the Third Annual Conference. Student grades were not significantly different for the ITFS group versus the on-campus group. Moorehouse (Ref. C-2,7) reported in the same conference that student grades did not significantly differ for ITV versus traditional delivery.

In the Fourth Annual Conference on Teaching at a Distance (1988), Munro (Ref. C-3,18) reported that students, making use of interactive computer graphic capability in rural locations, consistently earned higher grades than those in the traditional classroom.

In the Fifth Annual Conference (1989), Douglas (Ref. C-4,16) reported that both achievement and attitudes toward course effectiveness did not significantly differ for three types of courses relative to traditional instruction.

Also in the 1989 conference, Behm (Ref. C-4,8) reported that over 60 years of research indicates no significant differences exist between learning by students in the conventional classroom and various distance approaches. Behm did raise the question, "Do distant learners suffer barriers to learning in higher order reasoning and open-ended problems solving due to their lack of tools, resources, and/or interactions?" No confirmative answer was provided.

Several articles, apart from the books and conferences reviewed, also add support for the contention that delivery systems provide about the same learning impact in terms of grade performance.

Beare (1989) (Ref. Art-4) compared six different instruction delivery systems for a special education course, "Behavioral and Environmental Management". A lecture approach was the control version; the five other approaches included:

- A. Lecture with videotape
- B. Telelecture
- C. Audio assisted independent study
- D. Video assisted independent study
- E. Video on campus

No significant differences occurred among instructional groups. Beare indicated that vicarious experience of instructor/student interactions was sufficient to ensure equivalent achievement.

Fletcher (1989) (Ref. Art-19) conducted a meta analysis (review) of 31 studies with respect to Interactive Videodisc Technology (IVT) applications. It was concluded that IVT instruction was more effective than the conventional approaches. Enhanced effectiveness occurred with more interactive features and with directed simulations.

Grimes (1988) (Ref. Art-23) compared two nonresident distant learner groups and a control group of traditionally lectured students taking a course in economics. The USA course was effective in teaching principles of economics to nonresident distant learner students. Statistically significant levels of improvement in the overall Revised Test of Understanding in College Economics (TUCE) occurred. Some semester distant learner groups demonstrated significantly greater economic learning than the control group.

Holdampf (1983) (Ref. Art-26) conducted a study comparing videotaped nursing lectures with main campus instruction. Opportunities were available for teleconferencing questions and weekly student/faculty conferences occurred. Program evaluations showed no significant differences in test score between students from the distant and main campuses.

Keene (1990) (Ref. Art-29) reported a study where three groups of Command and General Staff Officer Course students were compared. The control group received conventional instruction methods, while the experimental groups received interactive video broadcasts from Ft. Leavenworth. Analysis of variance procedures showed distance learning (students receiving teleconferencing) achieved significantly higher scores than the control group on three of four outcome measures. Two concerns were that students were not randomly assigned to conditions and no assessments of relative technology contributions were made.

McCleary (1989) (Ref. Art-38) compared on-campus students with those receiving two-way interactive television. Learner performance was similar to on-campus course results.

Ritchie (1989) (Ref. Art-44) studied a traditional group, a

studio (live) group, and a studio with TV monitors group. Each group was given a 13-minute nominative clause lecture.

Performance tests showed the traditional group did not differ in achievement from either of the other two groups, while the distance group scored higher than the studio (live) group. Measures of interaction were coded from videotapes, but no performance effects occurred in this study. Perception results did differ, showing that distance students experience less involvement/enjoyment.

Sassone (1986) (Ref. Art-47) investigated both effectiveness and retention regarding Training Extension Course (TEC) lessons versus conventional instruction methods. TEC trained soldiers performed better than conventionally trained soldiers on both the initial and retention hands-on performance tests.

Twarog (1988) (Ref. Art-53) reported two didactic approaches; each one was applied to teaching and to reteaching foreign languages. The first approach made use of teacher assistance at a learning center with a trained teacher, while the other made use of the same kind of teacher assistance standards/methods, but provided oral tests over the telephone. The telephone assistance method results showed students performed better in learning new languages. The reviewing students produced grades with over 95 percent correct test responses for the languages being relearned where the telephone assistance approach was used.

Whittington (1987) (Ref. Art-56) reviewed over 100 documents where telecourses were compared to on-campus courses. The experimental studies showed either no differences in the amount of learning or that telecourse students actually performed better. This finding holds for live interactive video instruction as well. Whittington also concluded that effective instructional design is crucial to student achievement whether delivered by television or traditional means.

#### SUMMARY:

Numerous comparative studies over time demonstrate no significant differences between television and conventional classroom student performance. Interactive computer graphics, interactive videodisc technology, and training extension course approaches, as well as telephone assistance in learning new languages, all produced better performance results than the conventional classroom. Effective instructional design is considered crucial to student achievement for either television or traditional delivery.

### III. Elements of Distance Education Course Design

Elements related to the design of distance education courses have been reviewed and/or identified by authors of distance education articles during the recent past, i.e., from about 1986. Some of the most pertinent conceptual aspects have been synopsized below.

#### GUIDELINES TO COLLECT STUDENT OUTCOME DATA:

Courses should be designed so that appropriate student outcome data can be collected. This should be done in such a way that teaching routine intrusions are minimized. Shavelson (1986) (Ref. B-3) identified conditions to secure reliable student outcome data as suggested:

- A. A sufficient number of sites for oversampling
- B. Extensive lead time for adequate administrator and instructor involvement in design
- C. Pretesting for all students across treatments
- D. Researcher on-site information gathering related to:
  - 1. Course format and requirements
  - 2. Integration of videolessons both in teaching and evaluation
  - 3. Conduct of review sessions
  - 4. Political factors affecting course implementation
- E. Posttesting for all students across treatments

#### THREE GENERAL COURSE DESIGN ELEMENTS:

Auerbach (1988) (Ref. C-3,6) presented discussion of audio-print course packages in the Fourth Annual Conference on Teaching at a Distance. Three general elements of course design are:

- A. Overall course planning
- B. Lesson planning
- C. Planning lesson components

#### PHASES OF INSTRUCTIONAL DESIGN:

In the Fifth Annual Conference on Teaching at a Distance, (1989), Gunawardena (Ref. C-4,26) indicated four macro-level phases specific to instructional design:

- A. Needs assessment
- B. Design
- C. Development and implementation
- D. Evaluation and revision

Six needs assessment elements are identified. The design



phase is to identify and document specifications for effective instruction. At the micro level of design, factors pertaining to lesson modules or sequences are addressed. Development and implementation could include activities related to video production. The last phase applies to all of the other three phases.

#### FACTORS SPECIFIC TO TELEVISION TEACHING:

Also in the 1989 Conference, Cyrs (Ref. B-1 and C-4,27) identified eight factors where skills needed for television teaching differ from those used in traditional teaching:

- A. Telecourse organization
- B. Use of visuals in TV format
- C. Oral presentation skills
- D. Looking good on television
- E. Use of interactive study guides
- F. Questioning strategies
- G. Packaging a telecourse
- H. Consumer assessment factors

These kinds of factors critical to teletraining courses are also addressed by Chute (1988) (Ref. Art-10) where he credits research conducted by Goldberg (1988), Balthazar (1988), and Youngblood et. al. (1987).

#### OTHER COMPONENTS OF INSTRUCTIONAL PLANNING:

A variation on the theme is provided by Coldeway (1987) (Ref. Art-12) in an instructional planning model, referred to as Instructional Systems Design (ISD). This behavioral approach includes five components that work together to teach and motivate learners.

- A. Behavioral objectives
- B. Instruction
- C. A criterion for measurement
- D. A contingency management system
- E. Remediation

Furthermore, ISD makes use of five phases:

- A. Analysis
- B. Design
- C. Course development
- D. Implementation
- E. Evaluation

#### COMMON SENSE PROPOSALS FOR SOLVING ONE DESIGN PROBLEM:

Proposed solutions to a design problem were reported by

Diehl (1987) (Ref. Art-15) for the Air Force Extension Course Career Development Courses (CDCs). The problem was that courses had been increasing in size and student course completions were decreasing. Course length and lengthening component parts were affecting student performance. The three proposals advanced were:

- A. Shorten the first volume of a multivolume course
- B. If new material is added, extraneous material should be removed, or break up the course into two or more shorter courses
- C. Compare the revision with what was replaced

#### SELECTION PROCEDURES FOR USE PRIOR TO COSTLY COMMITMENTS:

Stubbs (1990) (Ref. Art-52) described a procedure which can be used as a guide for device selection prior to costly commitments relative to electronic distance education (EDE). Critical dimensions of EDE include:

- A. Time and place dependence
- B. Ease of use
- C. Immediacy of communication
- D. Communication linkages
- E. Degrees of abstraction

A Potential Effectiveness Inventory (PEI) was developed to be used as a first step to help evaluate educational delivery systems. The experts used to develop and evaluate the instrument ranked the above EDE dimensions in the following order of importance: D, B, E, A, and C.

Stubbs also reported that media experimenters find that learning seems to be affected more by what is delivered and how the medium is used than by the delivery device per se. Stubbs also reports that Clark and Salomon (1986) indicated that media comparison studies show no significant differences with respect to learning outcomes.

Lane (1989) (ref. Art-34) reported a two-round Delphi technique application to develop a selection model and pre-adoption evaluation instrument for video programs. Fifty-seven questions are allocated to nine areas:

- A. Educational objectives (6 items)
- B. Instructional design (14)
- C. Content (2)
- D. Textbook (4)
- E. Faculty guide (6)
- F. Student study guide (4)
- G. Computer software (5)
- H. Video (12)

#### I. Cost (4)

The author suggested that specific criteria can be used to evaluate multi-media or combinations of media and factors related to a given course.

#### SUMMARY:

Courses should be designed so that appropriate student outcome data can be collected. Planning of courses, the relevant lessons, and their components are general course design elements. Macro and micro level phases of instructional design must meet needs and results must be evaluated. Factors specific to television teaching can make a difference to teletraining effectiveness. Solutions to instructional design problems should follow common sense procedures. Evaluation of educational delivery systems by sound selection procedures can help identify the best programs prior to costly commitments.

#### IV. Economic Considerations Related to Distance Education

Zigerell (1991) (Ref. B-4) reported that costs incurred in offering a telecourse include:

- A. Licensing or purchasing fees
- B. Salaries for local support instructors and clerical expenses
- C. Expenses for student support services
- D. Recording and transmitting video program costs
- E. Promotion/advertising
- F. Travel

Costs are sometimes shared among institutions, e.g., colleges, partnerships, or consortia.

Part III (Ref. C-5,III) of the Public Service Satellite Consortium (PSSC) (1989) proceedings also provided a review of distance learning economics. Return on investment is based on people who have had distance programs that would not have had the courses because of campus distance for regular courses.

Specific factors to also consider include:

- A. Direct costs to recover
- B. Audience size required
- C. Growth to be seen
- D. Incurred expenses for other education alternatives (courses that are across the country)
- E. Two for one programs/group rates
- F. Series discounts
- G. Subscriptions to be used by people in organizations
- H. Videotape sales/rentals; other ancillary materials; cassettes, excerpts, transcripts
- I. License fees per organization per site
- J. Partial sponsorship for commercial time

Chute (1988) (Ref. Art-10) reported that travel expenses and productivity losses are avoided by use of the teletraining (TT) mode. Chute referred to another study by Chute and Hulick (1987) which reported an AT&T study comparing six delivery modes of instruction. The two most cost-effective modes were audio and audiographic TT. From the macro and micro levels of cost comparison, all modes studied were more cost-efficient than traditional delivery.

Fletcher (1989) (Ref. Art-19) in the meta analysis (review) of 31 Interactive Videodisc Technology (IVT) studies found that IVT was cost effective for several applications. However, cost ratios varied greatly over the total number of studies.

Pugh (1991) (Ref. Art-43) conducted a field survey of videoteletraining systems in public education, industry, and the military.

The Satellite Education Network (SEN) operated by the U.S. Army Logistics Management College at Ft. Lee, VA was studied.

The SEN student examination scores did not significantly differ from those of equivalent resident course student scores. The SEN cost was 27 percent of that to train a student on a resident basis. Thus, SEN produced essentially the same performance for significantly less cost.

Additionally, an evaluation of the Navy Electronic Schoolhouse Network indicated that differences between final grades of students at remote and originating sites are not "practically significant" and that there is a potential for training costs to be reduced by using VTT. Of the sites surveyed, all of those with evaluation information available indicated positive attitudes and/or no significant grade difference results.

#### SUMMARY:

Specific regular telecourse costs were identified by Zigerell. A series of other factors were also identified in the Public Service Satellite Consortium (PSSC) (1989). Teletraining helps reduce expenses. The two most cost effective modes in the Chute and Hulick (1987) study were audio and audiographic TT. Two military related studies reported positive results: the use of the Satellite Education Network (SEN) and the Navy Electronic Schoolhouse Network.

## V. Distance Education Evaluation Approaches

### SPECIFIC AND INDEPENDENT EVALUATIONS:

In the Distance II Conference (1986) (Ref. C-1,II), it was suggested that assessment of telecourse outcomes should relate to their natural settings and to the study of unique outcomes. Additionally, it was suggested that third party (independent) evaluators should be hired to evaluate the components of projects relative to the project goals.

In the Third Annual Conference on Teaching at a Distance (1987), Dirr (Ref. C-2,III) further discussed evaluation issues. Proposal reviews for courses should be provided by external advisory committees for quality control. Measures of telecourse success include: viewership, college adoptions, and course enrollments. Dirr suggested that not only should disinterested third party evaluators skilled in evaluation be used to evaluate telecourses, but also the same ones should level their scrutinizing to the on-campus courses.

### AUDIENCE EVALUATION:

Kovel-Jarboe (Ref. C-2,II), addressing the question of audiences for evaluation related to distance education at the same conference (1987), suggested five evaluative issues:

- A. How a delivery method compares to what was used previously
- B. Comparative effectiveness
- C. Comparative ease of use
- D. Comparative attraction to learners
- E. Comparative expenses

Audience (user) questions should include: should they try it?, and what (equipment/experience) is needed to do so?

### OTHER EVALUATIVE PARAMETERS AND CONSIDERATIONS:

In the 1988 conference, Roweton (Ref. C-3,17) identified seven parameters for sound educational evaluation:

- A. Use multiple measures
- B. Use multiple testing formats
- C. Give time for cognitive activity
- D. Measure both content and process
- E. Design tests to guide instructional planning
- F. Produce understandable test results
- G. Make summary reports fair to students, teachers, and schools

Additional evaluation issue considerations are presented in part VI of the PSSC conference (1989) (Ref. C-5,VI). One needs to look at performance to determine if instruction imparts abilities the learner did not have before. In order to do this, specific attention should concern:

- A. Measuring performance by entry and exit (pre and post)
- B. Ruling out ability acquisition from other sources by using a control group
- C. Evaluation of:
  - 1. Summative self-contained packages (the whole)
  - 2. Formative parts of the system
  - 3. Ultimate retention of abilities over time

Ritchie (1989) (Ref. Art-44) points out that distance students experience less involvement, question asking, and overall enjoyment. Although interaction did not affect performance in this study, attitudes may precipitate influences on course completion and/or future course enrollments. Thus, evaluation research should address relationship issues like the correlation between technology familiarity and interaction, as well as aptitudes that interfere/help with interactions under distance education situations.

#### SUMMARY:

The importance of independent (third party) evaluators was stressed at two conferences. Five evaluative issues relevant to distance education audiences were identified. Seven parameters for sound educational evaluation were specified. How to measure performance to determine if instruction imparts abilities the learner did not have before was addressed. The importance of evaluating issues like the impact of technology familiarity, interactions, and aptitudes that can interfere/help with interaction was also discussed.

**VI. Individual Factors - Attitudes/Aptitudes  
Strengths/Weaknesses and Problems Related to Distance  
Education Performance**

**FACTORS AFFECTING STUDENT ATTITUDES:**

Zigerell (1991) (Ref. B-4) identified some specific factors that do affect student attitudes:

- A. Boredom of droning lectures
- B. Poorly lighted sets
- C. Lack of adequate support:
  - 1. Not enough tutor/instructor meetings
  - 2. Not enough study material to gauge progress
  - 3. Being short changed on personal contacts -  
instructor/student and student/student

**FACTORS AFFECTING STUDENT SUCCESS:**

From the Chicago TV College study, Zigerell identified three factors of importance that related to student success regardless of television or class delivery, noting that some students learn from texts and study guides without other teaching assistance:

- A. Self-motivation
- B. Maturity
- C. Prior academic preparation

In Fellenz's study (Ref. C-2,13), reported in the Third Annual Conference on Teaching at Distance (1987), eight factors were identified as having learning impact on adult distance education:

- A. Setting
- B. Instructor
- C. Learner motivation
- D. Media use
- E. Peer interactions
- F. Learner style
- G. Time commitments
- H. Learner personal development

**INSTRUCTIONAL TELEVISION STUDENT PROBLEMS:**

In the Fourth Annual Conference on Teaching at a Distance (1988), Kromholz (Ref. C-3,5) identified four problems to address related to instructional television (off-campus) students:



- A. Unpreparedness for distance learning loneliness
- B. Fear of the technology (equipment)
- C. Frustration due to unsuccessful talks with professors
- D. Lack of clarity about research oriented subjects

#### FACTORS AND THOUGHTS ON OVERCOMING STUDENT PROBLEMS:

It was pointed out in part II of the Public Service Satellite Consortium (PSSC) proceedings (1989) (Ref. C-5, Part II) that managing independent learning and sustaining study are better accomplished by those who have a clear focus as to why they are in a course and on what they want to achieve.

Coggins (1988) (Ref. Art-11) identified two major implications for practice related to completion of external degree programs:

- A. Special provision for high risk students without two years of successful college experience/need for preadmission counseling
- B. Initial course should be one in which the student has intense interest and strengths

Cookson (1989) (Ref. Art-14) reported findings by Siqueira and Lynch (1986) which support the interest/strengths implication by Coggins; course satisfaction alone predicted 28 percent of the variance related to course completion. Cookson also reported Billings (1986) found that students who made the most progress "intended" to complete a nursing correspondence course in three months. The significance here is that students specified a goal on a time limiting basis.

Ehrman (1989) (Ref. Art-18) indicated "better learners" have the ability to shift among learning styles in response to circumstances. The role of motivation is also stressed by Ehrman who says "People tend to associate with what they like and put more effort into those things. We practice what we prefer and what we practice we tend to perfect."

Dille (1991) (Ref. Art-16) specified seven high risk telecourse student factors which can be summarized as follows: The younger (less than 25 years old), divorced, college inexperienced (having less than 30 college credit hours), with GPAs less than 2.9, who are externally oriented (perceive luck and others to control), who have a need for social contact, and require a more concrete learning style (not flexible enough) have less likelihood to succeed.

Whitlock (1989) (Ref. Art-55) identified two major factors

that affect learning climate:

- A. Peer group attitude
- B. Expert expectations

Again, learner motivation is stressed, "If the learner is motivated, the course package will be studied. Motivational factors are also identified, such as the desire to pass a professional exam or the need for a course to advance in work. Failure may relate to a course having little value or inadequate feedback.

"Learner and course objectives must match." The level of prerequisite knowledge and the learning style required need to be considered as well. Attention span and the size of learning step must also be within the tolerance limits of those taking the course.

#### SUMMARY:

Factors that affect student attitudes and success are identified. Eight factors that impact adult distance education learning are also specified. Four problems that instructional television students have are addressed. Various factors and thoughts on overcoming student problems are discussed.

## VII. Specific Actions to Help Improve Distance Education Student Performance and Course Completion

### GETTING A GOOD START:

In the Third Annual Conference on Teaching at a Distance (1987), Adams (Ref. C-2,17) explains how important a good orientation program is for distance students. It should include:

- A. Program policies
- B. Program procedures
- C. Discussion of independent study participant problems and solutions
- D. Goal setting
- E. Time management

Such an orientation program was shown to reduce the attrition rate from 60 percent to below 50 percent at the University of Wisconsin.

In the Public Service Satellite Consortium (PSSC) proceedings - Part I (1989) (Ref. C-5,Part I), it was reported that instruction can be improved by presenting a 5-minute videotape during the first class session, when it is explained that the interactive system and expectations about student roles and responsibilities with respect to feedback to the instructor are important.

In the Third Annual Conference (1987), Meister (Ref. C-2,3) indicated that a focus on early humanizing to teleconferences is important to participation. Participants need to be given guidance, variety, and repetition. They should be:

- A. Told what they are going to do
- B. Talked through what it is they are doing
- C. Given review of what they have done

Kinsey (1986) (Ref. Art-31), reporting on an MBA distance learning course that made use of self-assessment questions and tutor contact, indicated two useful techniques for new students to use:

- A. Read quickly through the whole package of materials/ texts before trying to absorb the package details.
- B. Get immediate feedback on assignments to improve motivation.

Knapper (1988) (Ref. Art-32) suggested several actions that may help students to acquire study skills for "life long learning". One that can be applicable under most learning

conditions is the use of networks where non-teachers are knowledge sources, e.g., librarians, peers, workmates, and/or subject matter experts.

#### FACTORS/METHODS/APPROACHES TO ACHIEVE BETTER DISTANCE LEARNING:

Coldeway (1988) (Ref. Art-13) discusses methods of conducting distance educational research, pointing to the deserved value of component research which determines the contribution of factors to an overall outcome. Component research lead to insight about the importance of:

- A. Learner motivation
- B. Frequent feedback
- C. Small units of instruction

In a panel discussion at the Fourth Annual Conference on Teaching at a Distance (1988), Gueulette (Ref. C-3,I) remarked that although program repetition results in more learning, a directed follow-up is even more effective. He further indicated that:

- A. Shortened programs can achieve minimum instructional objectives.
- B. Opportunities to raise questions helps learning effectiveness.
- C. Immediate feedback provides greatest impact on learning.
- D. Planning how a broadcast will be used is critical to its integration with instruction. A plan should include the following:
  - 1. Introduce new ideas
  - 2. Summarize points
  - 3. Give visual support
  - 4. Expand viewer world
  - 5. Explore feelings
  - 6. Clarify points
  - 7. Reinforce key concepts

Gunawardena, at the same conference (1988) (Ref. C-3,3), suggested the use of supplementary materials to help students learn from television programs:

- A. Pre-broadcast preparation notes for what is to be seen
- B. Follow-up exercises after viewing the program
- C. Exercises during transmission to effect interaction
- D. Screen presentations for immediate feedback
- E. Study guides to help integrate television with total course

In the Fifth Conference (1989), Mitcham (Ref. C-4,22) reported that novelty and opportunity were stronger motivators for distance students than for on-site students and that stimulation and affect set the tempo for teaching a course in occupational therapy.

In her contribution to the Fourth Conference (1988), Watkins (Ref. C-3,3, PartII) reported that student grades were demonstrably better after the use of 15 minute cassette lectures where students were:

- A. Allowed to work at their own pace
- B. Allowed to use the concept building lesson approach
- C. Given the optional opportunity for participation in group discussions

In the Fifth Conference (1989), Ehrmann (Ref. C-4,30) reported there was a movement toward stressing depth rather than simple coverage of material. Students need to:

- A. Pose problems
- B. Make progress - solve problems
- C. Persuade others their progress has been worthwhile

In a study reported at the Fourth Conference (1988), Marlaire (Ref. C-3,7), addressing the problem of math skill deficiencies, details an approach which emphasizes:

- A. Understanding and applying math concepts/not just drills
- B. Use of a PC and video lessons via videodiscs
- C. Assignments based on a prescriptive test
- D. Video segments based on correct/incorrect responses
- E. Students select their own pace
- F. Competency tests at the end of each lesson must be passed before going to each succeeding lesson

In the Fifth Annual Conference (1989), Ward (Ref. C-4,10) described four distance learner support systems:

- A. Interactive computer delivered orientation to telelearning - assessing student readiness for distance learning
- B. Group-viewed, group paced, coached telecourses - group audio and video segment sessions with a faculty member functioning as coach
- C. Cassette check-out - tapes made available at neighborhood learning centers
- D. Voice mail - students can give instructors questions and get rapid feedback

Meister (1987) (Ref. C-2,3) suggested some guidelines

specific to teleconference participants relative to computer readiness for use:

- A. Participants need to be where they should be in the computer program.
- B. Questions need to be directed to specific persons/locations.
- C. Time needs to be allowed for participant responses to questions.
- D. The number of locations and participants must be manageable for the computer instruction given.

In the Fourth Annual Conference (1988), LeFebvre (Ref. C-3,11) suggested where additional support and guidance are needed, learners might be:

- A. Paired with other learners (peers)
- B. Networked
- C. Tutored by knowledgeable peers

Barker (1988) (Ref. Art-3) reported a study using the Texas Interactive Instructional Network providing one-way video and two-way audio instruction. Although the results were moderately positive, two cautions/suggestions were made:

- A. Where a call-in system is used, the equipment should not be slow and inefficient.
- B. Breaks should be given at appropriate intervals (the author suggested every 15 minutes as is accustomed by television).

Lauzon (1989) (Ref. Art-36) discussed the application of the Personalized System of Instruction (PSI) approach and how the learning process can be enhanced by the use of computer-assisted learning (CAL) which gains active student participation. In the article, findings by Leppman and Hermann (1982) were reviewed where students receiving PSI in a CAL environment performed better and were more satisfied than students in the conventional classroom. The PSI system components include:

- A. Written materials
- B. Material mastery
- C. Self-pacing
- D. Frequent testing
- E. Feedback

One caution in relation to computer conferencing (CC), also discussed in this article, is that McCreary and Van Duren (1987) found differences in the rate and nature of student participation in CC according to academic level.

Several provisions were deemed important, reported by McCleary (1989) (Ref. Art-38) in a study of a three course sequence using two-way interactive television (ITV) for distance learning:

- A. Classes should be challenging.
- B. Course design elements are critical to the success using this instruction medium.
- C. Visual materials and media are most effective when used to clarify concepts/show techniques
- D. Feedback and course organization are crucial to program development using two-way ITV.

#### SOME CROSS-CULTURAL CONSIDERATIONS:

A pilot project to test a microcomputer-based self-testing system for remote learners in rural Thailand is described by Moore (1988) (Ref. Art-40). The system was based on PSI. Leppman and Hermann are referred to as reporting that students using PSI achieved final exam scores consistently one letter grade higher than those in conventional classes. This type of gain was attributed to:

- A. Frequent testing, and
- B. Immediate feedback system features

In a cross-cultural study reported in the 1988 Conference, Smith (Ref. C-3,12) discloses that learning style features that worked to teach nutrition among the Hmong refugees in the U.S.A. included:

- A. Giving directions
- B. Giving examples
- C. Use of cooperation
- D. Use of group interaction via interactive videotapes
- E. Use of small interactive groups (less than 15 people)

In the PSSC conference - Part V (1989) (Ref. C-5,Part V), advice for those trying to move material from one culture to another was discussed:

- A. Try the material out on the new audience before implementation.
- B. Train tutors in the new culture.
- C. Questions for those in developing nations include:
  - 1. What are the actual education needs?
  - 2. How well are these needs being met now?
  - 3. What alternative ways can the needs be met?
  - 4. Is distance education an alternative?
  - 5. Is distance education cost effective,

politically wise, and educationally sound?

#### THE EMPATHETIC TUTOR CAN ELICIT DESIRED RESULTS:

In the Fifth Annual Conference on Teaching at a Distance (1989), Holmberg (Ref. C-4,I) reported a study by Rekkedal who tested the tutor role:

- A. The control group students may have had several different tutors and discussed only academics.
- B. The experimental group students had only one (the same) tutor and discussed:
  - 1. Academic issues
  - 2. Administrative issues
  - 3. Tuition issues
  - 4. Counseling issues as needed

This empathy theory approach demonstrated significant differences favoring the experimental group:

- A. Course completion results
- B. More active in their studies
- C. Greater numbers of completed study units and courses during the experimental period

#### PROBLEMS AND SOLUTIONS RELATED TO COURSE COMPLETION RESULTS:

Billings (1989) (Ref. Art-5) reported background literature related to a model for completion of correspondence courses. Billings reports that Childs' (1971) reasons for course non-completion included:

- A. Job interference
- B. Boring courses
- C. Lack of faculty contact
- D. Too much course work involved

Further Billings contributions included literature findings of:

- A. Di Silvestro and Markowitz (1982) who found learning contracts motivated early first lesson submissions, noting that Donehower (1986) showed that students who did not complete courses started submitting lessons long after enrollment
- B. Anandam and Fleckman (1987) used telephone contacts to induce lesson submissions and course completions

Cookson (1989) (Ref. Art-14) also conducted a literature search related to distance education methods and student outcomes. He reported that Chacon-Duque (1985) found:



- A. Lower course difficulty was associated with early attrition
- B. Higher difficulty with later attrition
- C. Moderate difficulty enhanced both completion and pass rates

Cookson also cited the Rekkedal (1983) study where lowering the turn-around time for assignments from 8.3 days to 5.6 days improved completion rates in a four-unit course from 69 to 91 percent.

Zigerell (1991) (Ref. B-4) indicated that job, family, and/or personal problems usually precipitate attrition (dropout) and that the predictors of failure include:

- A. Socioeconomic disadvantage
- B. Reliability/Self-discipline
  - 1. Not attending scheduled orientation sessions
  - 2. Not completing and returning informational surveys distributed with course study materials

In order to reduce attrition several suggestions were offered:

- A. Discourage students deficient in academic background from independent study programs.
- B. Telecourse students below 20 years of age need:
  - 1. Supplemental instruction
  - 2. Knowledge in usage of computers/equipment
  - 3. Support to increase active involvement
- C. Use video and computer combination to produce active responses and show mastery, i.e., make telecourses interactive.
- D. Use CAI to allow give-and-take between student and instructor.
- E. Use face-to-face/telephone conferences for support.
- F. Take preparatory or prerequisite courses to overcome academic deficiencies.

In the Fifth Conference (1989), Dillon (Ref. C-4,24) reported evaluation results of learner support services in a distance education system. Several service improvement needs were identified:

- A. Availability of a library
- B. Counseling services
- C. Better audio system
- D. Faculty training on the use of television
- E. Faculty training on the meeting of student needs

Dillon further indicated that course success was a function of:

- A. Instructor related interactions
- B. Print based support
- C. Self-determination

The Holdampf (1983) (Ref. Art-26) study of associate degree nurses showed how several specific actions lead to a better completion rate for distance education students than for main campus students ( 78 percent versus 48 percent):

- A. Students could ask questions after videotaped lectures via teleconferencing.
- B. Library facilities were provided for the distance students.
- C. Weekly faculty/student conferences addressed all aspects of curriculum and student progress.

Hesketh (1989) (Ref. Art-25) reported a study by Gick and Holyoak (1983) who found that by using a statement or graphic representation of an underlying principle, the percentage of students solving a target problem increased, but, only when two analog examples were used together with the principle. Hesketh further cites a number of studies relating to schema (mental models). They tend to increase the probability that an analogy will be noticed where the schema developed allow elements to be perceived in something new but similar:

- A. Schema facilitate learning simulated control panel operations when direct clues about operating procedures are provided (Kieras and Bovair, 1984).
- B. Higher retention and transfer to new task versions occurred when subjects were given different task variations randomly (Shea and Zimny, 1983).
- C. Exploration-based training produced better results when compared to instruction-based training (Kamouri et. al., 1986).

By teaching such ways of thinking, students may be helped to achieve better and complete their courses.

Also in the Fifth Conference (1989), Gilcher (Ref. C-4,17) identified seven principles that "most successful instructors" using audio-graphic conferencing technologies follow:

- A. Plan in advance the integration of visual material into presentation.
- B. Ask or solicit questions frequently.
- C. Keep the screen active.
- D. Supply lecture outline and screen copies.

- E. Use silence to allow student thought.
- F. Maintain spontaneity and humor.
- G. Make use of the technology.

Chung (1991) (Ref. Art-9) reviewed the telecourse literature and showed that media comparisons typically do not produce significant differences. Within that review, Chung reported results of the Roush (1983) study which specified nine behaviors (skills) deemed important by 100 percent of the respondents as pertaining to television classes:

- A. Clarifying materials
- B. Answering questions
- C. Summarizing topics
- D. Designing evaluations relative to objectives
- E. Maintaining a learning atmosphere
- F. Willingness to explore viewpoints
- G. Demonstrating enthusiasm
- H. Providing timely feedback
- I. Distributing course materials

Also reported in this study were three characteristics of excellent television instructors:

- A. Enthusiasm
- B. Attention-keeping presentation style
- C. Use of a variety of teaching techniques

Wilkinson (1990) (Ref. Art-57) addressed an additional problem that pervades higher education identified by Ellis and Knaus (1977). They reported estimates up to 95 percent of college students engage in academic procrastination - the act of needlessly postponing academic tasks. Strategies to reduce academic procrastination included:

- A. Establishing due dates on all assignments
- B. Providing directions concerning student obligations/expectations
- C. Requiring periodic contacts with instructors
- D. Periodically mailing reminders of assignments and due dates to all students

There may be differences in course completion and success results where special features are needed for the group taking the course and those features are missing. For example, Romiszowski (1989) (Ref. Art-45) pointed out that low-literacy, young children, and rurally educated groups can benefit from radio/television programs if an organized group environment is applied -- not from home study or correspondence approaches.

Whittington (1987) (Ref. Art-56) concluded, from a research review of instructional television effectiveness, effective instructional design is crucial to student achievement whether delivered by television or traditional means.

#### SUMMARY:

Several policies, the use of an introductory video tape, structuring of what is included in a course, as well as other useful suggestions for the new distance learner are enumerated. The directed follow-up approach, broadcast planning elements, and specific supplementary materials are suggested to help achieve better distance learning.

Stressing depth rather than just material coverage, the use of distance learner support systems, guidelines for computer readiness, the application of the Personalized System of Instruction (PSI), and the results of a study using two-way Interactive Television (ITV) provide further helpful ideas to improve distance learner results. Cross-cultural applications of PSI and learning style features demonstrated value. Questions to ask before implementing cross-cultural materials are specified. The effectiveness of an empathetic tutor role was demonstrated. Reasons for course non-completions are identified. The use of learning contracts, telephone contacts to induce lesson submissions, lowering assignment turn-around time, and many other suggestions to reduce attrition are given. Strategies to reduce academic procrastination are specified. The importance of instructional design is reiterated as crucial to student achievement whether delivered by television or traditional means.

## Conclusions

As mentioned in the Introduction, the recent distance education literature addresses issues relevant to the Army strategic goals E, F, and H indicated in the TRADOC LONG RANGE TRAINING PLAN.

Appropriate media mix ultimately depends on delivery of subject materials and the purposes of usage/application. Purposes include the use of media to:

- A. Communicate information to be learned
- B. Clarify concepts/abstractions
- C. Practice newly acquired skills
- D. Stimulate participation
- E. Provide student/student, student/tutor, student/instructor interaction
- F. Provide other meaningful feedback.

Course design must take these purposes into account when organizing and developing a given course in order to maximize learning. Students must have the tools needed to participate and interact to prevent attrition and achieve desired performance levels at course completions.

Studies, such as Lasser (1981) (Ref. Art-35), have shown that video as an additional teaching aid produced higher grades than approaches to educational delivery without the video provision. Lookatch (1989) (Ref. C-4,20) demonstrated four unique instruction features provided by the interactive laserdisc system that include:

- A. Material can be paced to individual or group needs.
- B. Trials/simulations can provide immediate feedback.
- C. Comprehension testing can be done in various contexts.
- D. Remedial activities can be provided.

Munro (1988) (Ref. C-3,18) showed that interactive computer graphics produced higher grades than those in the traditional classroom. The Fletcher (1989) (Ref. Art-19) meta analysis (review) of 31 studies concluded interactive videodisc technology was more effective than conventional approaches and was a function of the degree of interaction. The more interaction, the more the effectiveness.

Beare (1989) (Ref. Art-4) indicated where there were no significant differences across instructional groups that interactions between instructors and students ensure equivalent achievement, i.e., the more interaction, the greater is the likelihood that performance will be satisfactory. Numerous studies comparing TV student and classroom student performance show no significant difference results. Reports of this general finding are volumetric and are identified via:

- A. Zigerell (1991) (Ref. B-4)
- B. Ritchie (1989) (Ref. Art-44)
- C. Behm (1989) (Ref. C-4,8)
- D. Dirr (1987) (Ref. C-2,III)
- E. Whittington (1987) (Ref. Art-56)

General findings from the literature study indicated that tele-training (TT) is cost effective when compared to traditional delivery. The Chute and Hulick (1987) (Ref. Art-10, 1988) study reporting on six delivery modes showed that:

- A. Audio and audiographic TT were the most cost-effective
- B. All modes studied were more cost-efficient than traditional delivery

Chute (1988) (Ref. Art-10) also reported that travel and productivity losses are avoided by the use of the TT mode.

Zigerell (1991) (Ref. B-4) pointed out that costs are sometimes shared among institutions, e.g., colleges, partnerships, or consortia.

Conditions to secure reliable student outcome data were identified by Shavelson (1986) (Ref. B-3). Evaluation should identify unique outcomes and be conducted by third party (disinterested) evaluators. Further structure to developing specific evaluation methodologies and pursuing course summative and formative evaluations should incorporate the five evaluative issues identified by Kovel-Jarboe (1987) (Ref. C-2,11) and the seven parameters for sound educational evaluation specified by Roweton (1988) (Ref. C-3,17).

To ensure that resource allocations are best directed, procedures which will maximize quality and quantity of training need to be established. The literature search specifically provides guidance along two major dimensions for the development of such procedures. Consider using a combination of both A and B below:

- A. Individual and psychological factors that relate to course success and completion can be applied to select who should attend specific distance education courses:
  - 1. Consider the seven risk factors identified by Dille (1991) (Ref. Art-16).
  - 2. Students indicate focus as to why they are taking the course and what they want to achieve.
  - 3. Students specify intent to complete the course in the expected time duration.
  - 4. Students indicate and show they do have interest and strengths in the subject content of the course.
  - 5. Students have or get equipment/technology knowledge for that used in the course.

6. Students have demonstrable motivation such as good grades in prerequisite courses.
7. Students have successfully completed other experiences with independent learning, e.g., correspondence courses.
8. Students have demonstrated flexibility in the applications of learning styles.

**B. Apply the factors/methods/approaches that have achieved better distance learning:**

1. Provide a good orientation program (outlined by Adams, 1987) (Ref. C-2,17).
2. Give a five minute videotape during the first class where interaction between student and instructor is explained.
3. Read quickly through the whole course package before trying to learn material in detail.
4. Use fifteen minute cassette lectures worked with at the student's own pace to learn/build concepts.
5. Use the provided study guide(s).
6. Use CAI to gain active participation.
7. Use small units of instruction for mastery.
8. Use pacing and time management.
9. Acquire supplemental instruction if applicable (other course work, peer/tutor use, library use).
10. Instructor characteristics should include:
  - a. Enthusiasm
  - b. Attention-keeping during presentations
  - c. Use of a variety of teaching techniques
  - d. Being knowledgeable in equipment use
11. Instructor methods:
  - a. Maintain quality audio and video equipment.
  - b. Use learning contracts to motivate early first lesson submissions.
  - c. Establish due dates to reduce academic procrastination.
  - d. Minimize assignment feedback turn-around time.
  - e. Encourage peer interactions/group discussions.
  - f. Provide teleconference question opportunities.
  - g. Provide weekly instructor/student conferences to address curriculum and student progress.
  - h. Apply the seven principles reported by Gilcher (Ref. C-4,17) in the Fifth Conference (1989) used by "most successful instructors".
  - i. Apply the nine behavior skills identified by Roush (1983); reported by Chung (1991) (Ref. Art-9)

- j. Use the supplementary materials suggested by Gunawardena (1988) (Ref. C-3,3) to enhance interaction/feedback.
- k. Teach principles giving at least two examples.
- l. Help develop schema (mental models).
- m. Present new task versions randomly.
- n. Make use of exploration-based learning; discovery techniques.

12. Provide counseling when applicable

The literature indicates several major factors relate to course success and completion:

- A. Ability to perform independent study
- A. Effective instructional design
- B. Use of exercises and frequent testing for mastery of small learning units
- C. Feedback, e.g., via teleconferences, on videotaped lectures, assignments, etc.
- D. Interactions: both student/student and student/instructor

The Army has many soldiers who are "at risk" relative to the seven high risk telecourse student factors identified by Dille (1991) (Ref. Art-16). Many Army personnel who might attend distance education classes are less than 25 years old, have less than 30 hours of college credit, may not have 2.9 grade point averages, and may not have developed independent study learning capabilities. Thus, the course instructional designs must be accommodative. The designs must include and apply the other factors relating to distance education course success and completion. Without the compensatory enhancement to learning that the exercises, practices, feedback, and interactions can provide, the soldiers without the independent learning skills may not achieve what is needed and wanted from distance education courses.



## APPENDIX A (Annotated Bibliography)

### BOOKS(4):

- B-1. Cyrs, Thomas E., Frank A. Smith, Teleclass Teaching, A Resource Guide, 2nd Edition, NMSU, NM, 1990.

This Resource Guide is to assist instructors/trainers to design complete Telecourses. Many lists, outlines, and formats are provided for this purpose. No research or data for evaluation of the system is provided. Rate: B.

- B-2. Flinck, Rune, Correspondence Education Combined with Systematic Telephone Tutoring, Hermods, 1978.

Telephone tutoring on correspondence course students was studied: Swedish group studied Economics; English group studied French. Experimental and control group results are presented. Rate: A.

- B-3. Shavelson, R., Stasz, C., Schlossman, S., Webb, N., Hotta, J., Goldstein, S., Evaluating Student Outcomes from Telecourse Instruction - A Feasibility Study, The Rand Corporation, 1986.

Experimental designs to evaluate student outcomes are discussed. The authors select what they call the patched up design. No significant differences between groups are found. Achievement gain and comparative levels of achievement provide information to evaluate course exchangeability. Conditions for securing reliable student outcome data are identified. The book is difficult to read, but the information is important. Rate: B.

- B-4. Zigerell, James, The Uses of Television in American Higher Education, Praeger Publishers, New York, NY, 1991.

A considerable amount of background information on telecourse development is given. Attitudes toward television teaching, the British Open University, the International University Consortium (IUC), the University of Mid-America (UMA), and the Annenberg/Corporation for Public Broadcasting Project (CPB) are reviewed. TV effectiveness, common elements of successful telecourses, costs to offer telecourses, and overcoming instructional problems with video technology are all discussed. The Chicago TV College study is reviewed. Student attrition reduction is addressed. Predictors of failure are identified. Rate: A.

## CONFERENCES

- C-1. Distance II. Improving Teaching at a Distance, August 6-8, 1986, Madison, Wisconsin, USA.
- C-2. Third Annual Conference on Teaching at a Distance: Evaluation of Teaching/Learning at at Distance, August 3-6, 1987, Madison, Wisconsin, USA.
- C-3. Fourth Annual Conference on Teaching at a Distance, Changing Roles in Education and Training, August 2-4, 1988, Madison, Wisconsin, USA.
- C-4. Fifth Annual Conference on Teaching at a Distance, Helping Learners Learn at a Distance, August 8-10, 1989, Madison, Wisconsin, USA.
- C-5. The Public Service Satellite Consortium (PSSC) - Proceedings from PSSC 1988 Audiobriefings, 1989, Washington DC, USA.

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Distance II: Improving Teaching at a Distance, 1986,  
Madison, Wisconsin.

This conference report contains five keynote addresses:

### C-1,I. Design of Distance Learning Programs, Erling Jorgensen

Learning principles applicable to learning at a distance are identified. The systems approach to instruction is emphasized as is the use of the scientific method. A four page outline of Improving Teaching at a Distance is provided, outline rating is A. Overall, Rate: B.

### C-1,II. Evaluating Distance Education, Peter Dirr

Goals and objectives of the Annenberg/CPB Project are reviewed. A research program is described, designed around seven areas/questions and relating to course effectiveness, students, and targets of opportunity for evaluation.  
Rate: A.

### C-1,III. Learners and Learning at a Distance, Michael Moore

Five qualities in distance education that the learner is looking for are specified. Right sources must be found to meet learner needs, for course content/presentation, and to accommodate student support systems. Rate: B.

### C-1,IV. Teachers and Teaching at a Distance, Dee Brock

This report reviews the Ellworth Study that looked at 2 and 4 year college faculty and administrators using the Annenberg courses. Study results are given with descriptive statistics and likes/dislikes. The best predictor of student course success was identified as attendance of on campus orientation. Television course marketing, faculty fears and overcoming fears are also issues addressed.  
Rate: A.

### C-1,V. Effective Administration and Support of Distance Programs, Michael Lambert

This address is reported as a series of outlines and relates to nine key points, e.g., student support, planning, mission objectives, and chart samples. Rate: B.

## CONFERENCES:

Third Annual Conference on Teaching at a Distance:  
Evaluation of Teaching/Learning at a Distance, University  
of Wisconsin, Madison, Wisconsin, 1987.

Four Keynote Addresses and 21 Conference Papers:

Four Keynote Addresses:

- C-2,I. Corporate View of the Evaluation of Distance Learning,  
L. H. Wirtz, Aetna Life and Casualty

The Aetna Institute produced a business writing telecourse  
available in 13 locations, tied to their broadcast satellite  
system. The 350 enrollees received three two hour segments.  
Evaluation included: de-briefings, questionnaires,  
interviews, and on-site observations. It was concluded that  
the telecourse did work. Rate: A.

- C-2,II. Examining Future Telecommunications Technologies,  
Larry Dickerson, Educational Communications Board, State of  
Wisconsin

Improvements in technologies and deregulation of the  
technologies have impact on telecommunications usages.  
There were nine delivery systems (methods) discussed.  
Rate: C.

- C-2,III. Critical Questions in the Evaluation of Distance  
Education, Peter Dirr, The Annenberg/CPB Project

There was a review of data pertinent to telecourses.  
Indicators of effectiveness, conditions for telecourse  
evaluation, and formative evaluation guidelines are  
identified. Rate: B.

- C-2,IV. Evaluation of Broadcasting in Education, A. W. Bates  
The Open University, UK

An outline is presented that covers adult learner  
differences, TV uses/problems/and uses/values of video  
cassettes. Rate: C.

Twenty-one Conference Papers:

- C-2,1. Evaluation of Student Outcomes in Distance Education,  
Charles Feasley, Okla. State University, OK

Exams are discussed; those requiring students to prepare an  
analysis or synthesis were of greatest value. Discussions  
include: validity, reliability, scales for attitude  
measurement, and item type examples. Rate: B.

- C-2,2. Principles of Effective Video Teleconferencing - What to Do and What to Avoid, John Marder, University of Wisconsin, Superior, Wisconsin

User questionnaires were given to persons involved with video teleconferencing (VT) and an administrator questionnaire was given to persons controlling budgets for VTs. Some results are given. Seven guidelines to do effective VT are specified. Rate: A.

- C-2,3. Computer Instruction and Enhancements Via Audio Teleconferencing, Gary Meister, AAA, Wisconsin

Four guidelines are given specific to teleconference participants and their computer readiness for use. Focusing on humanizing the teleconference includes providing guidance, variety, and repetition. Rate: B.

- C-2,4. Implementation Handbook for GED on TV, Maija Wimer, J. Tucker, Odessa College, Odessa, TX.

Major goals and objectives are outlined and detailed as requirements for an active GED program on TV. Rate: B.

- C-2,5. Shaw, W. D., Education via Satellite: A Trinational Perspective, Academy for Educational Development

Audio conferencing networks in Indonesia, the West Indies, and Peru are reviewed. Lessons learned, problems with the programs, project effectiveness, and costs were discussed. Rate: B.

- C-2,6. Wagner, N., The Operation and Evaluation of the Instructional Television System at Arizona State University, Tempe, AZ.

Evaluations from on site visits and questionnaires were reviewed relative to ASU Instructional Television Fixed Service courses. Positive results were reported. Rate: A.

- C-2,7. Morehouse, D. L., Evaluating Interactive Television: Methods, Findings, and Issues/Minnesota's Technology Demonstration Program, Menomonie, WI

Background of ITV demonstration programs in Minnesota was addressed. The evaluation model is explained. Interviews, document reviews, and case studies were given in the first phase of evaluation. The second phase included qualitative and quantitative measures. Five major findings are specified. Costs and ITV effects on school districts are also addressed. Rate: A.

C-2,8. Byrne, Joan, Evaluating Experiential Learning for Distance Learners, Metropolitan State University, Minnesota  
Guidelines for assessment of distance learners were developed from workshops delivered to faculty groups.  
Rate: B.

C-2,9. Jonsen, R., McGill, M., Policy Questions for State and Regional Action to Support the Use of Information Technologies in Higher Education, Western Interstate Commission of Higher Education (WICHE)

The driving idea for higher education has been access to education. Equity in use has also been a concern. Seven major actions for state policy makers are identified. An example of interstate cooperation is given. Rate: C.

C-2,10. Kelly, E. A., Developing a Public Policy on Distance Learning and Information Technology: A checklist of Issues, Minnesota Higher Education Coordinating Board, Minnesota

A checklist of 14 issues is presented to stimulate thinking about public policy. Rate: C.

C-2,11. Kovel-Jarboe, Patricia, Is There an Audience for Evaluation of Distance Education?, TDC, Minnesota Extension Service

The author identified three audiences for evaluation, five evaluative questions (comparison guidelines), and six approaches to answer the question "Does it work?" Rate: A.

C-2,12. Lienau, L., Evaluation of Teaching/Learning at a Distance, School District of Alma Center - Humbird - Merrillan, Wisconsin

Survey results for the 1987 school year are presented about the Western Wisconsin Communications cooperative two-way instruction cable delivery system. Results were not especially positive. Rate: B.

C-2,13. Fellenz, R., Blackwood, C., Seamons, A., Variables Affecting Adult Learning in a Distance Education Setting, Montana State University

The study sought to identify variables that affected adult distance education program learning. Interviews were audio recorded. Eight variables are identified. Rate: B.

C-2,14. Seamons, R. A., The Influence of Teaching Style and Instructional Device Use on Student Satisfaction and Student Preference in Electronic Distance Educational (EDE) Methods, Utah State University, Logan, UT

Electronic distance educational methods are experimentally compared with on-campus methods. Mean scores and findings relating to teaching styles as well as other variables are reported. Rate: A.

- C-2,15. Inch, Barbara, Change Triggered By Computer Technology: Its Implications for Faculty Development, Continuing Education /Outreach

Computer technology impact on faculty members was studied. Surveys and semi-structured interviews were used. Variables relating to computer usage were identified. Rate: B.

- C-2,16. Dehner, T. R., A Skills Assessment Strategy for Distance Learning, Empire State College/SUNY

An early skills assessment process was developed. Five interrelated elements for assessment, advisement, and development were identified. Rate: C.

- C-2,17. Adams, J. C., New Student Orientation Workshop - Getting the Distant Learning Student Off to a Good Start, SUW Platteville, Platteville, WI

The orientation program addresses policies and procedures, as well as problems and solutions that students encounter. The program was largely responsible for improved student retention. The dropout rate fell from 60 to below 50 percent. Rate: A.

- C-2,18. Shaeffer, J., O'Donnell, C., Faculty Training for Teaching Via Technology, University of Wyoming, Western Wyoming College

A continuing medical education program used teleconferencing to meet their needs. 'How to' issues when teaching via technology were of most interest. Four components are addressed as useful relative to institution goals and resources. Rate: B.

- C-2,19. Dixon, D., Cullen, K., Multi-Media Approach to Statewide Teacher In-Service, WBVTAE, UW - Extension

An in-service program for a Vocational, Technical, and Adult Education Consumer and Homemaking staff was described. Both paper and telephone surveys were used to evaluate participant experiences. Five concepts related to successful distance learning were listed. Rate: A.

- C-2,20. Veit, D., Teacher Training Via UAA's Rural Special Education Program, University of Alaska, Anchorage, Alaska.

The article addressed handicapped children and off-campus graduate student needs in remote Alaska. No evaluation results were reported. It was noted that a built-in support system to reduce the drop-out rate was needed. Five measures based on student performance were identified which the author believes relate to course success. Rate: B.

C-2,21. Balsamo, Peter, A Model for Distance Learning: Combining Computer Telecommunications, Pre-Produced Videotapes, On-Campus Instruction and Audio Teleconferencing, Radford University, VA

The report summarizes an audio teleconference format and identifies obstacles that the approach overcomes. A media format is outlined in four steps. Rate: C.



## CONFERENCES:

### Fourth Annual Conference on Teaching at a Distance: Changing Roles in Education and Training

Madison Wisconsin, August 2-4 1988

#### Six General Sessions/Keynotes:

##### C-3,I. Panel Discussion: Changing Roles in Education and Training

Contributors: Gibson, T., Gueulette, D., Bornstein R.

Learners are looking for new ways to learn and instructors need new skills to make use of new technologies. The concept of andragogy is emphasized - learners perceive learning experience goals to be their own. Video effectiveness is discussed as a learning tool. Student attitudes toward television are a function of five perceptions. Five basic rules to integrate television into instruction are identified. Five ideas are presented to solve the problem of transition from traditional to technological educational orientation. Rate: A for topics contents discussed; but only B due to no reported data support.

##### C-3,II. DeGraff, J., Satellite Education and an Appeal For Democratic Reform, National Director, Communications and Education, Domino's Pizza Corporation

The corporate viewpoint on satellite education is addressed. Ten ways to get pizza makers to watch satellite education are suggested. Indicators of individual readiness for satellite education are identified. The pro's and con's of satellite education are enumerated. The goal suggested is to get people what they want when they need it/then, television can help. Since the corporate viewpoint is uniquely presented, Rate: A; but needs data support.

##### C-3,III. Maskowitz, H., The Annenberg/CPB Project: A Midcourse Perspective, The Annenberg/CPB Project

A summary of developments to 1988 for the Annenberg project is given. Research was ongoing regarding distant learners, variations in teaching modes, and how resources are being used. Rate: B.

##### C-3,IV. Hall, G., Future Directions in Distance Education, Public Broadcasting Service

The concept of hypertext via Integrated Services Digital Network (ISDN) is discussed. The technology will provide

linking people to information so books, films, or paper can be acquired as end products. The technology is important to future educational results, but no support data is given relative to if this works effectively, efficiently, and at cost that is reasonable. Rate: B.

C-3,V. Moore, M., Introduction of the Charles A. Wedemeyer Award, PA State University

This award is for an outstanding article published in the American Journal of Distance Education. Rate: C.

C-3,VI. Duning, B., Correspondence Study and the New Media, University of Colorado-Boulder

Three barriers to overcome relative to future education expectations and growth are specified. Three observations about new technologies and three predictions as a result of their use are identified. Rate: B.

Twenty-six Information Sessions and Seminars:

C-3,1. Baird, M., Monson, M., Strategies for Applying Audio Teleconferencing to Distance Education and Training, University of Wisconsin-Extension

Four strategies relative to teleconference participant effectiveness and satisfaction are identified and discussed: humanizing, participation and examples, message presentation, and feedback. Rate: B.

C-3,2. Muchnik, M., Petrilli, S., Program and Design Considerations in Videoconferencing, Governors State University

Project team member functions for a participatory workshop are specified and an example videoconference case study about "Racism on Campus" is discussed. Criteria for selecting proposed videoconferences are outlined. Project team proposals were rated by the seminar membership. Conclusions for a successful videoconference are offered. Rate: B.

C-3,3. Techniques for Improving Media-Based Learning

Part I. Gunawardena, C., Learning From Television, University of Kansas

Materials, approaches, and techniques considered effective to help students learn from television are enumerated. A paradigm for integrating video-based instruction is outlined and discussed. Rate: B.

Part II. Watkins, B., Learning from Audiocassettes,  
University of Kansas

Forty-three audiotapes provided text for a course in General Biological Concepts for college students. Grade point averages were better after the materials for the course were developed than for the prior traditional course. Five measures of course acceptance by students were specified. Rate: A.

C-3,4. Keir, P., Ward, E., Distance Learning: A Faculty Primer,  
College of DuPage

A distance-delivered training module was developed. Role categories were identified. The Primer for Faculty includes 7 major components reflecting what students also must encounter. Rate: B.

C-3,5. Kromholz, S., Adapting to the Non-Traditional Classroom:  
Training Programs for Faculty and Students, University of  
Maryland, College Park

Background for the University of Maryland ITV system is discussed. Reaction report data revealed two problems with their initial ITV programs. An eight step planning process for ITV program development is discussed. New faculty had fewer problems than long-term faculty members with an ITV orientation program. Student problems were identified. Further research is underway. Rate: A.

C-3,6. Auerbach, E., Clauder, L., Christian, J., Teaching at a  
Distance with Audio-Print: Faculty Perspectives, University  
of Wisconsin-Madison/UW-Extension

Audio-print course packages and course design elements are discussed. From one to three units from a course are chosen for formative evaluation. Five evaluative guidelines and eight integrating features of the study guide are specified. Rate: A.

C-3,7. Marlaire, M., Interactive Basic Math - The Instructor's  
Role, Wisconsin Foundation for Vocational, Technical and  
Adult Education

Math skill deficiencies relative to entering technical programs are discussed. A system to teach basic math, emphasizing understanding and applying concepts, is taught via a PC/20 videodiscs. It is called Interactive Modumath. The student takes a prescriptive test; then selects own pace. Results of the program need to be given. Rate: B.

- C-3,8. Burnham, B., An Examination of Perceptions and Motivations of Faculty Participating in a Distance Education Project, Utah State University

This study was an evaluation of the LearnerNet Project at Utah State University. Five areas were studied using interviewing and qualitative analysis methodologies. An electronic audio graphic delivery system was used. Instructors became better organized; students were viewed as highly motivated and performed at similar levels of achievement or better than those in the face to face setting. Motivations for instructor involvement were identified. Other concerns and results are given. Rate: A.

- C-3,9. Nordmann, D., Assessing Learner Preferences - A Multi-Dimensional Approach, University of Wyoming

Courses conducted by Colorado State University were videotaped. Students lacked opportunity for interaction with other students and instructors. Factors related to learning models were analyzed. The most desirable learning model was teacher-centered with lecture and professional development oriented. Rate: B.

- C-3,10. Fiss, J., Using Desktop Publishing and Related Technologies for the Enhancement of Distance Education Programs, University of Wisconsin-Madison

The use of the MacIntosh software/hardware and desktop video editing are discussed. Rate: C.

- C-3,11. LeFebvre, J., Coggins, C. C., Changing Roles of Teachers and Adult Learners in a Non-Credit Distance Education Format, University of Wisconsin-Madison

Audio tapes and printed materials for an educational program, "Using Credit Wisely", were used relative to specific student needs. Evaluation of the program was conducted through questionnaires and telephone interviews. Special considerations that need to be addressed by educators and support staff are identified. Learner difficulties relate to skills; suggestions for support and guidance are made. Rate: A.

- C-3,12. Smith, K., Spriggs, J., "Saving Food Dollars": Development and Evaluation of an Interactive Videotape Package for Hmong (Indochinese) Audiences, University of Wisconsin-Extension

The purpose was to teach, via videotape technology, nutrition to the Hmong refugees living in the U.S.A. Learning style features were identified. Guidelines for

low-literate adults were established. Videotape instruction positively affected nutrition knowledge. Videotape evaluations of results also indicated program value. This was a unique cross-cultural program, even though conducted in the U.S.A. showing positive results with some data support. Rate: A.

C-3,13. Cordes, D., Conducting Successful Multi-Hour Teletraining, VA Medical Center, Washington, DC

Cordes found three factors to be more important than audio-teletraining duration that show value in the learning experience. This was demonstrated in day-long teleconference programs where learners were involved in the process and faculty determined that learning was occurring during the process. Rate: A.

C-3,14. Hagstrom, D., An Integrated Approach to Serving Professionals with Graduate-Level Distance Education, University of Alaska Fairbanks

An Educational Leadership program was offered via U of A by distance educational delivery modes. The approaches are described. The program allows education availability and instructor/student interaction across great distances. No evaluation is provided. Rate: B.

C-3,15. Frazier, H., Billings, D., Student Support Services for Videoteleconferencing in Nursing Education, School of Nursing, Indiana University

The approach allows educational opportunities for nurses that would otherwise be unavailable. Support needs are outlined. Special features of television instruction are identified. Data support was provided. Students were found to compare favorably in achievement with traditional classroom students. Rate: A.

C-3,16. Reilly, D., Information Networks: New Roles for Libraries in Education, University of Wisconsin-Madison

A CD-rom approach to information dissemination is described. Frequently used database subsets can be acquired by campus online networks via subscription. New horizons/problems are enumerated. Rate: B.

C-3,17. Roweton, W., Wess, R., Motley, B., America's Rural Colleges and Distance Education: The Electronic Classroom in the Information Age, Chadron State College

A state wide pilot system of a hardware/software

configuration is described where participants have access to a common electronic resource library. Seven parameters for educational evaluation provide a good guide to develop meaningful measures. Rate: A.

- C-3,18. Munro, H., Meeting the Needs of Rural Learners Using Audio Teleconferencing and Computer Graphic Technology, Community College of Spokane, WA

The paper describes background to where a variety of courses have successfully been networked for delivering campus based programs to isolated rural areas. Students in rural areas have consistently earned higher grades than those in the traditional classroom. The results indicate cost effectiveness, access to campus based services, computer literacy, and quality education. Rate: A.

- C-3,19. Wilsman, M., Distance Education in Action: The Wisconsin Rural Reading Improvement Project, Wisconsin Public Radio and Television Network

The objective of the North Central Regional Education Laboratory (NCREL) is to learn about reading improvement and share the information with six other states and regions. One external evaluation was conducted, but actual results were not provided. Another evaluation indicated the school districts were not benefiting as expected. The latest approach was to model reading as thinking. External evaluation will include student testing in the future. Rate: B.

- C-3,20. McDevitt, M., Using Two-Way Television in Elementary and Secondary Schools, University of Lowell, MA

Instructional strategies for teaching via two-way television were identified. Rate: C.

- C-3,21. Foote, V. Rogers, S., Omland, P., Sundloff, L., The Key Program: A University/School Partnership, Rochester Institute of Technology (RIT), Perry School District

RIT provides courses taught at first year college level in calculus, English, and social studies for high school seniors. Interaction and flexibility are employed as are videotapes, weekly audioconferences, and on-line course catalog access. Programs were identical to on campus course counterparts. Results were presented in terms of percentages. Videotapes did not contribute to learning, while audioconferencing was important and useful. The in-class teacher was also important. Rate: A.

- C-3,22. Yurkovich, S., Johnson, P., Rountree, S. WCU MicroNet:

An educational Computer Teleconferencing System: Past, Present, Future, Western Carolina University

The most used features of the system included electronic mail and the conferencing system. MicroNet advantages are enumerated as are a series of problems. Rate: C.

- C-3,23. Anderson, T., Arblaster, J., Cole, S., Croft, M., Derks, P., Roberts, J., Cooperation and Collaboration in Distance Education: The Contact North/Contact Nord Experience

Strategies related to risk and benefit potentials were ranked for educational institutional cooperation. Nord attempts to move institutions toward the high risk/major benefit end to the spectrum. The project involved access to educational opportunities and meeting needs of Northern Ontario people. The project was created in less than one year and served 27 network points offering 40 courses. Rate: A.

- C-3,24. Kovel-Jarboe, P., Change Strategies for Technology Adoption in a University Setting

A five year grant from W. K. Kellogg Foundation to the University of Minnesota allowed conduct and evaluation of research using new and emerging electronic technologies for education. In-depth interview data produced reported findings. Time, money, and fear were barriers to telecommunication technology use. A budget request was reported to be under review. Rate: B.

- C-3,25. Warren, K., Report of the University of Wisconsin System Task Force on Telecommunications, University of Wisconsin System

An executive summary of a seminar/demonstration on telecommunications identified six concerns relative to instruction/delivery for distance education and the future. Rate: C.

- C-3,26. Dewees, P., Information Technologies: Shaping State Policies to Serve Rural Learners, Ohio University

Equity issues relative to telecommunication networks to deliver distance education are discussed. Some solutions are suggested and quality assurance for telecommunications courses is discussed as a function of state policy; examples are given. Rate C.

## CONFERENCES:

### Fifth Annual Conference on Teaching at a Distance

Madison, Wisconsin, August 8-10, 1989

#### Keynotes & General Sessions:

##### C-4,I. Distance Education with a Human Face

Borje Holmberg, Fern Universitat, ZIFF, Germany

The Rekkedal tutor role research results are reported as relating to the empathy approach, i.e., where distance study is made attractive and personally relevant to students. Control group students may have had more than one tutor and discussed only academics, while the experimental group students had only one special tutor for each student and discussed a variety of student related issues. Significant differences favoring the experimental group are identified. Rate: A.

##### C-4,II. Time is Money and Vice Versa: Reflections on Using Satellite Delivery to Improve Cycle Time and Quality

John Robinson, Motorola Training and Education Center

Business related challenges can be met only if information abundance is appropriately managed/controlled. Education and communication are assisted by satellite delivery systems. Eight startup considerations are specified for business satellite network systems. Rate: C.

##### C-4,III. Distance Education: Consolidating the Gains

David Grossman, University of Minnesota

The article discusses the "two-culture" problem that retards the role of technological usage with distance education delivery. Indicators of being out of step are discussed for six areas. Suggestions to build bridges between the two-cultures are given. Rate: B.

##### C-4,IV. The Human Resource Imperative

Pamela Atkinson, University of California - Berkeley

The author decries the national educational mediocrity level. Educational excellence, life long learning, investment in people, improvement in skills, as well as new actions relating business, government and workers are all advocated. Rate: C.



#### C-4,V. Developing Short Courses for Business and Industry

Susan Kryczka, Northeastern University

The Northeastern University interactive instruction network is described. Videotape script excerpts for four courses are presented. Interview comments of a faculty member involved with TV short course work is presented. Where to seek faculty for recruitment is suggested. Rate: C.

#### Thirty Information Sessions and Seminars:

##### C-4,1. Hypertext: A New Way of Accessing and Organizing Information

Greg Kearsley, Park Row, Inc.

Hypertext allows browsing, i.e., jumping from idea to idea in a database following links provided. HyperCard and other systems are identified. Future prospects are also addressed. Rate: C.

##### C-4,2. Site Coordination and Support Services

Roberts, J., Harvey-Foulds, E., Contact North/Contact Nord

The project objective is to improve educational opportunities for residents of Northern Ontario via regional centers and sites. The roles of site coordinators for this project are identified. Recruitment, training, supervision and morale are also covered. A case study is described. Student support services are also discussed. Rate: C.

##### C-4,3. Coordinating the Use of Cable Technology in Oakland County, Michigan

Linda O'Donnell, Oakland Schools  
Mary Gholz, Clawson Public Schools

The Oakland Schools pilot project was to provide cost-effective instructional video via I-NET. An evaluation and user survey indicated strengths and weaknesses of the project. Their workshop was evaluated favorably. Specific evaluation statements with percentages of true and false responses are given. The authors concluded the cable technology provides immediate access to an in-house instructional video library and increased opportunities for staff development and training. Rate: A.

##### C-4,4. Telecommunications Instructional Consortium: Waubensee Community College's Interactive Television Program

Blakesley, L., Regnier, J., Waubensee Community College (WCC)

A telecommunications instructional consortium expands

opportunities to high school students and brings college credit courses to additional districts. All site program delivery is via a two-way interactive microwave system. The delivery system allows cost-savings. Satellite teleconferencing can be used for staff and students. Document delivery is by courier. Rate: C.

C-4,5. How to Develop Successful and Profitable Adult Education Certificate Programs

Glen Hoyle, CUNA HRD Department

CUNA/HRD has demonstrated that credit union people respond positively to a structured curriculum. Demand for further programs has increased. Training audiences, educational methodologies and content levels identified. Rate: C.

C-4,6. India's Experience with Distance Higher Education: Indira Gandhi National Open University

Jay Miller, Ursinus College

This paper reviews the historical development of the Indira Gandhi National Open University. Operational information is discussed. Criticisms and concerns are specified. It does give students a chance at higher education and is soon to be the world's largest OU. Rate: C.

C-4,7. Supporting Individual Learners at a Distance

Daniel Granger, S.U.N.Y. Empire State College, NY

The major theme is that distance learner needs must be met. Six stages of the educational planning process for the individual are identified. Rate: C.

C-4,8. The Soft Touch in Distant Education: Research in Learner Support

Behm, R., Molise, G., San Diego State University  
Threlkeld, R., California State Polytechnic University

The author states that over 60 years of research indicates no significant differences exist between traditional and distance learning. The question is, "Do distant learners suffer barriers to learning in higher order reasoning and open-ended problem solving?" A learner support program, PROFNET, is discussed. A research study related to PROFNET is described. Interviews of PROFNET students, faculty and support staff provided for the development of an extensive questionnaire which was given to three groups. Issues of agreement were identified. Rate: A.

C-4,9. An Evaluation of Learner Support Services in a Distance Education System

Connie Dillon, University of Oklahoma  
Charlotte Gunawardena, University of New Mexico  
Robert Parker, Oklahoma State Regents for Higher Education

Surveys were administered to on-campus and distance students to determine differences relative to quality of learning resources. Statistical comparisons and specific results are given. Very few differences were found. Factors related to course success and performance hindrances were identified. Rate: A.

C-4,10. Supporting Distance Learners: Devices That Work

Eileen Ward, College of DuPage, Glen Ellyn, Illinois

Four distance learner support systems are described that help students pursue college courses through the Center for Telelearning:

- A. Inter-active computer-delivered orientation to telelearning
- B. Group-viewed, group-paced, coached telecourses
- C. Cassette Check-Out
- D. Voice Mail

Each support system is discussed. Rate: B.

C-4,11. Assessing Adult Learning Strategies

Robert Fellenz, Montana State University, Bozeman, Montana

Learning skills and learning strategies are discussed. Five aspects of the learning process having the potential to improve learning strategies are reviewed. Two instruments to assess learning strategies are identified. Rate: C.

C-4,12. Goal Accomplishment Style and the Long Distance Learner

Kathryn Atman, University of Pittsburgh

The 'will' as an energy source and skill is reviewed. The Conation Cycle and related objectives are offered as a way to strengthen distance education program completions. Rate: C.

C-4,13. Strategic Education: Distance Learning for Business Needs/The learning process; the essential nature of the dialogue

Beutel, C., Go, Mac J., Pacific Bell, San Ramon, California

Student/teacher interaction via dialogue through the use of voice mail and a series of applications are discussed. Rate: C.

C-4,14. Application of Instructional Television in the Farm Training Program (FTP) at Northcentral Technical College NTC)

Vern Doenier, Northcentral Technical College

The FTP at NTC is an adult farmer education program that uses ITV. A field research project was conducted. Student acceptance and farm management ability were measured to determine effective ITV and videotape uses as compared to traditional instruction. Statistical analysis was not complete at the time of the article. However, six important observations were specified. Rate: A.

C-4,15. Distance Education Through Interactive Television: Is It Effective?

Egan, M. W., Page, B. C., Department of Special Education, University of Utah

Preliminary analyses of five television delivery systems are presented. On-campus and distance learners responded to a media evaluation instrument. Students were prospective teachers. Statistical results were given and reviewed. One group included only four students. However, all four television-mediated delivery systems equalled/exceeded ratings given to the face-to-face system. Other differences were also identified. Rate: A.

C-4,16. Effectiveness of Interactive Satellite Delivery Versus Traditional Delivery in Selected Courses

Patricia Douglas, Colorado State University

Corporate Education Network (CENET) provides IBM with continuing education via the Interactive Satellite Delivery System. Thirty CENET participants in three courses were compared to students receiving traditional instruction. Achievement and attitudes were compared. Results showed no significant differences across the three courses. Rate: A.

C-4,17. Various Uses by Instructors of PC-Based Audiographic Conferencing Technologies

Kay Gilcher, The University of Maryland University College, College Park, Maryland

The PC-based audiographic conferencing equipment and uses for instructors and students are explained in detail. Interviews were conducted with faculty, students, and administrators involved at nine institutions. Applications, strategies, and factors influencing successful networking were identified. Seven principles that most successful instructors follow were also specified. Rate: A.

C-4,18. Computer Conferencing and the Distance Learner: Problems of Structure and Control

Romiszowski, A. J., Jost, K. L., School of Education, Syracuse University, NY

Multi-media networks, benefits, and problems of computer mediated communication (CMC) are identified. CMC provides a social communication system. Instructor strategies and group facilitator suggestions are given. An alternative to structured conferencing systems is E-mail; other approaches are also discussed. Rate: B.

C-4,19. Developing Hypermedia for the Learning Environment

LeGrand, B. F., Mehler, G., University of Illinois at Urbana-Champaign

Uses of hypertext and hypermedia extensions are explained. A prototype topic for officer Army engineers, "Intelligence Preparation of the Battlefield" made use of the concept map approach and incorporated it into the software system to allow text selection. Recommendations for future hypermedia developments are given. Further testing is planned. Rate: B.

C-4,20. Level Two Interactive Laserdisc: A Low Cost Alternative for Active Distance Learning

Lookatch, R. P., John H. Harland Company

Four unique instructional features of the interactive laserdisc systems are specified. Two authors are referenced with reviews of 28 and 30 studies indicating value in terms of:

- A. Interactive laserdisc instruction over other methods
- B. This technology produced at least as much learning as traditional approaches.

Level two interactive laserdisc systems offer two unique benefits:

- A. Operational simplicity
- B. Direct and indirect cost advantages

Rate: A.

C-4,21. Moving Independent Study into the 1990's: Tapping Communication Technologies

Holman, D. J., University of Wisconsin-Madison

Three applications of technology are suggested through the use of electronic mail. A case study about networked electronic mail, Worldnet, is presented. Rate: C.

C-4,22. Bridging the Gap: Building a Sense of Community for Graduate Students at a Distance

Mitcham, M., Medical University of South Carolina

Wlodkowski's Time Continuum Motivation Model is applied and described relative to an occupation therapy course. Six factors are considered in the model. Novelty and opportunity were stronger motivators for distance students than for on-site students. Competence guidelines and structured grading were discussed. Course evaluation and external review demonstrated overall effectiveness. Rate: A.

C-4,23. The International Business Negotiation Simulations

Rawson, J. H., CIDE, The University of Maryland University College

Workshops focused on Korea and Japan negotiation simulations for business executives. Both generic and area specific modules were developed. Several pilot studies verified the design and structure soundness. All teams reached their goals, the creation of a joint venture agreement. Rate: B.

C-4,24. Instructional Strategies, Distance Education and Student Involvement

Dillon, C., Hengst, H., Zoller, D., The University of Oklahoma

Student involvement is examined as a function of faculty strategies used to teach distance students via instructional television. Surveys and telephone interviews were used to collect data. Data were statistically analyzed. Results are well documented and summarized. Some conclusions are drawn. Rate: A.

C-4,25. Self-Directed Learning Readiness in Distance Education

Harring-Hendon, J., University of Wisconsin-Green Bay

Fifty-one students enrolled in the Extended Degree Program completed the Self-Directed Learning Readiness Scale. Seventy-two percent scored above average for self-directed learning. Data identified inadequacies that required attention for improvement. Several suggestions emerged. Rate: A.

C-4,26. Instructional Design Considerations in the Development of Computer Assisted Interactive Video (CAIV)

Gunawardena, C. N., University of New Mexico  
Saito, M. University of Oklahoma

Four phases are identified at the macro level of instructional design and development. Needs assessment elements are specified. Video production guidelines are also specified. Micro level

design factors are also discussed. Instructional events related to CAIV and the meta-mode, ROPES, are also discussed. Rate: A.

C-4,27. Designing a Teleclass Instructor's Workshop Addressing the Differential Skills Needed for Quality Teleclass Teaching

Cyrs, T. E., Center for Educational Development, NMSU

Skills needed for television teaching differ from those used in traditional teaching. Eight differing factors are identified. Rate: B.

C-4,28. The Application of an Audio Computer-graphics System to Distance Education in a Baccalaureate Nursing Program

Bollinger, M., Danon, N., Maddox, K., University of Wisconsin-Eau Claire School of Nursing

Teaching approaches incorporated "humanizing", "participation", "message style", and "feedback". Data are presented in questionnaire item format. Some learner response results are discussed for on and off campus students. On-campus results tend to be more positive. Sample sizes were small. Rate: B.

C-4,29. Producing Telecourses for Adult Distant Learners: A Cooperative Model

Purdy, L., Coastline Community College

Problems and limitations concerning available telecourses are identified. New telecourse needs are clustered into six areas via results of a national survey. The article points out that the Annenberg/CPB Project telecourses do not necessarily fit with student needs. The Coast Community College District in California telecourse project approach and success are discussed. Rate: B.

C-4,30. Toward Sustainable Improvements in Accessibility and Quality

Ehrmann, S. C., The Annenberg/CPB Project

Two basic improvement goals and four dimensions of interaction are specified. The four interaction dimensions are further explored using second year French as an example and indicating how technologies apply to the example. A movement to stress depth rather than coverage of material is emphasized. Rate: B.

## CONFERENCES:

### The Public Service Satellite Consortium (PSSC) (1989): Six Parts

#### C-5, Part I: Training to Teach at a Distance.

Several notable people in the distance education field contributed their thoughts on the general subject. Distance learning was defined. The importance of student/instructor interaction and the use of an explanatory videotape during the first class session are discussed. Evaluating training effectiveness and faculty performance as well as key measures of course success are also addressed. Rate: B.

#### C-5, Part II: Strategies for Learning at a Distance.

Reasons why students select learning at a distance courses and why they do well or not is discussed. Pre-class video tapes and orientation packets help to clear uncertainties for new students and meet student needs. Most frequently encountered materials distribution problems are identified. Rate: B.

#### C-5, Part III: The Economics of Distance Learning: Business or Social Service?

Specific costs associated with distance learning are identified. Return on investment and intangible benefits to distance education programs are discussed. Ten economic factors to consider relative to distance education programs are also specified. Rate: B.

#### C-5, Part IV: Technological Invention and Educational Innovation: Conflicting Perceptions.

Organizations have different perceptions about needs relative to what distance education should provide. Cost justification is discussed. Rate: B.

#### C-5, Part V: International Trends in Distance Learning.

The move to multi-media approaches to delivering distance education is discussed. Advice is given about cultural difference accommodation when trying to move materials from one culture to another. Questions for those in developing nations to ask before implementing distance education programs are presented. Rate: B.

#### C-5, Part VI: Distance Learning: The Final Exam.

Considerations about program value and course content are examined. The need to evaluate the percent of time devoted to program aspects or functions is stressed. Rate: B.



**ARTICLES from a Variety of Sources (57):**

- Art-1. Abrioux, Dominique, Computer Assisted Language Learning and Distance Education, Journal of Distance Ed., Vol. IV, No. 1, 1989.**

This article reviews functions of Computer Managed Instruction (CMI) and computer Aided Learning (CAL) with respect to second language teaching at a distance. It is opinion based, but no research data to support the conclusions are offered. Rate: C.

- Art-2. Atman, K. S., Psychological Type Elements and Goal Accomplishment Style: Implications for Distance Education, The American Journal of Distance Education, Vol. 2, No. 3, 1988**

Two questions related to self-management, as a crucial factor for distance education student success, are posed. The Jung "type" construct, as measured by the Myers-Briggs Type Indicator and the Goal Orientation Index, developed by Atman, are both presented and compared. Elements from both appear to be associated with the self-management skills required by distance students. The author suggests alerting individuals to their relevant weaknesses, if applicable, and makes some additional recommendations. Rate: A.

- Art-3. Barker, B. O., Platten, M. R., Student Perceptions on the Effectiveness of College Credit Courses Taught Via Satellite, The American Journal of Distance Education, Vol. 2, No. 2, 1988**

This report discusses the Texas Tech University experience with a two-year pilot project using the Texas Interactive Instructional Network. Usable responses from a 36 item survey were obtained from 26 students (83.9 percent return). SAS provided descriptive statistics for the project results. Results were reported in terms of percentages of response. The authors concluded that there is a need to improve the call in system and to give breaks. No comparison group of traditional students was evaluated and the sample was relatively small. Rate: B.

- Art-4. Beare, P. L., The Comparative Effectiveness of Videotape, Audiotape, and Telelecture in Delivering Continuing Teacher Education, The American Journal of Distance Education, Vol. 3, No. 2, 1989**

Six alternative delivery methods for distance education were

compared, using a special education course, "Behavioral and Environmental Management". The sample included 92 undergraduate and 83 graduate students. The delivery methods were independent variables, while the dependent variables were: percentage of correct responses on exams and course evaluations. No significant differences occurred among the instructional groups. The video assisted independent study group was more likely to agree with taking a video format course again than the video on-campus group. Students with audio assisted independent study course experience indicated video assisted independent study group preference over audio-only. Rate: A.

- Art-5. Billings, D. M., A Conceptual Model of Correspondence Course Completion, The American Journal of Distance Education, Vol. 2, No. 1, 1988

Background literature was well reviewed for the issue of course completion behavior. A model for completion of correspondence courses was developed. All variables and paths from background variables to a dependent measure, progress toward course completion are shown in Figure 1, page 25 of the Journal. These variables are discussed. Rate: A.

- Art-6. Brillantes, R. M., Jorgensen, P. F., Kelley, T., A Comparative Analysis of Mediated Instruction: An Exploratory Study, San Diego State University, CA.

Background literature references about televised instructional effectiveness and the face-to-face versus televised delivery "no difference" hypothesis are discussed. Other relevant studies are also discussed. The research question was: What are the affective differences between three concurrent environments in ITV? Differences in five areas are specified. Frequency data is provided. Rate: A.

- Art-7. Burge, E. J., Howard, J. L, Audio-Conferencing in Graduate Education: A Case Study, The American Journal of Distance Education, Vol. 4, No. 2, 1990

Student perceptions of the effects of the absence of visual cues in audio-conferencing (AC) on learning were reported. Data from 14 courses were analyzed. Both open and closed items were on the survey. Overall feelings of course success were positive. Although 56.9 percent felt comfortable with the medium, some did not. Recommendations to reduce microphone frustration and for the AC moderator were given. Ideas for further study were also suggested. Rate: A.

- Art-8. Burke, M., Green Bay Area ITFS System of K-12 School Districts Provides Model for Wisconsin, The American

This study reviews evaluation results from a pilot study covering a wide variety of programs with 15 Northeast Wisconsin Telecommunications Education Consortium (NEWTEC) schools under Project B.E.S.T. Both teachers and students stated that interactive distance education was an excellent use of interactive television. Findings from surveys and interviews by the ITFS staff supported conclusions from Simonson et. al., 1989. Similar results were found in an evaluation of the pilot semester of the Green Bay area ITFS system (Burke and Garrard, 1989). Factors contributing to success are identified. Future distance education in Wisconsin is further discussed. Rate: A.

- Art-9. Chung, Jaesam, Televised Teaching Effectiveness: Two Case Studies, Indiana University, Bloomington, Indiana, Educational Technology, January 1991

Chung reviews the nature of telecourses from related literature, provides evidence from literature and a case study showing that media comparisons typically do not produce significant differences. Characteristics of excellent television instructors are identified and described via another case study. Rate: A.

- Art-10. Chute, A.G., Balthazar, L.B., An Overview of Research and Development Projects at the AT&T National Teletraining Center, AT&T Nat. TeleT. Center, Cinn. OH, 1988.

Both learning and acceptance as aspects of instructional effectiveness are addressed. Results with data support are provided. Other topics covered include: cost/benefit analysis, course and curriculum development, evaluation of account executives, media attributes and system implementation, as well as, future research directions. Rate: A.

- Art-11. Coggins, C. C., Preferred Learning Styles and Their Impact on Completion of External Degree Programs, The American Journal of Distance Ed., Vol. 2, No.1, 1988

Graduates and dropouts from extended degree programs were compared on learning style, measured by the Canfield Learning Style Inventory. No significant differences were found between the groups on demographic measures. Significant differences between completers and non-completers were found. Implications for practice were given and areas needing further research were also identified. Rate: A.

- Art-12. Coldeway, D. O., Behavior Analysis in Distance Education: A System Perspective, The American Journal of Distance Education, Vol. 1, No. 2, 1987

An instructional planning model, referred to as Instructional Systems Design (ISD) is described. It makes use of five behaviorally related components that work together to teach and motivate learners. The ISD approach makes use of five identified phases. The importance related to distance education is emphasized. Rate: A.

Art-13. Coldeway, D. O., Methodological Issues in Distance Educational Research, The American Journal of Distance Education, Vol.2, No. 3, 1988

This article deals with concepts/approaches to conducting research. Scientific research is defined. Evaluation is distinguished from research. Goals related to the method of triangulation are specified. Component research and its value is explained. Calvert's conceptual framework is provided for distance education application where input, process, and outcome variables are specified. Rate: B.

Art-14. Cookson, P. S., Research on Learners and Learning in Distance Education: A Review, The American Journal of Distance Education, Vol. 3, No. 2, 1989

Research topics derived from ERIC, Dissertation Abstracts International, The Social Citation Index, and Teaching at a Distance were categorized into distance education methods and student outcomes. Reasons for non-participation and dropout results were discussed. Numerous specific studies are cited and report results related to achievement, dropouts/course completions. Rate: A.

Art-15. Diehl, G. E., Hidden Agenda in Course Construction and Revision, The American Journal of Distance Education, Vol. 1, No. 1, 1987

The United States Air Force Extension Course Institute provides about 350 Career Development Courses to teach Air Force Specialties. It was observed that course size increases were occurring with decreases in course completions. Factor analysis showed number of volumes and pages related to noncompletions. Three proposals were advanced to help solve the problem. Rate: B.

Art-16. Dille, B., Mezack, M., Identifying Predictors of High Risk Among Community College Telecourse Students, The American Journal of Distance Ed., Vol. 5, No.1, 1991

This study relates to aspects of retention and academic success in telecourses. Demographic characteristics of 151 telecourse students were presented in a table. Three instruments were completed by participants. Instrument features are explained. Dependent variables were course grades and

course success (grade of C or better). Independent variables were scores from the RIELC and LSI instruments. Statistical tests were performed on the data to test three null hypotheses. Seven variables were found to be significant in predicting success in the telecourse. Results are discussed for each hypothesis. A profile for the high risk telecourse student is specified. Results suggest factors for student guidance before telecourse enrollment. Rate: A.

- Art-17. Dillon, C., Faculty Rewards and Instructional Telecommunications: A View from the Telecourse Faculty, The American Journal of Distance Education, Vol. 3, No. 2, 1989

A 20 item survey was administered to 100 faculty members teaching telecourses. The Statistical Analysis System (SAS) was used to determine descriptive statistics. There was considerable variety in responses. Eighty percent did indicate willingness to teach a telecourse again. Criticisms included amount of work and concern for academic credibility. Telecourse quality and difficulty equality with on-campus courses were deemed acceptable. Student performance was considered as good or better than that on-campus. Advantages and disadvantages as well as what development efforts are needed were also identified. Rate: B.

- Art-18. Ehrman, M., Psychological Factors and Distance Education, The American Journal of Distance Ed., Vol. 4, No. 1, 1989

A number of theoretical positions are discussed: learning styles, field dependence, the Kolb model, Jungian approach and the Myers Briggs Type Indicator. The importance of learning style adaptability is stressed as relating to best selection of learning strategies. Several psychological factors having implications for distance education are discussed and eight speculations about psychological variables relating to distance education are suggested. Rate: B.

- Art-19. Fletcher, J. D., The Potential of Interactive Videodisc Technology for Defense Training and Education. Report to Congress, Institute for Defense Analysis, Arlington, VA, January 1989

A meta analysis (review) of 31 studies regarding interactive videodisc technology in education and training pertaining to effectiveness, cost effectiveness, and other functions was conducted using the Glass (1976) alternative to the 'box score' approach. Interactive video instruction was found to be more effective than conventional approaches. Rate: B.

- Art-20. France, Ralph, Videodisc Feasibility Study. An

Evaluation of the Use of Videodisc as a Distribution Medium., International University Consortium for Telecommunications in Learning, Maryland Center for Public Broadcasting, 1983.

The article reviews consortium people perceptions about videodisc technology and costs. Ratings were taken from multiple levels, e.g., students, tutors, etc., and locations. The course was IUC's "Exploring Language." Rate: B.

- Art-21. Gardner, C. H., Tillman, M. 1H., Installation and Use of a Remote Electronic Bulletin Board in Teaching a Graduate Level Course, The American Journal of Distance Education, Vol. 2, No. 3, 1988

Fourteen doctoral students enrolled in "Research in Instruction" at the University of Georgia's College of Education. They represented various health fields. Major features of the software package, Remote Bulletin Board System for the IBM PC, are identified. Three types of data were obtained. Five lessons learned are specified. Rate B.

- Art-22. Gibson, C., Questions and Research Strategies: One Researcher's Perspective, The American Journal of Distance Education, Vol. 4, No. 1, 1989

The importance of distance education context(s) and differences from the traditional context must make research findings suspect for generalization. Five strategies to answer questions related to appropriate advancement of distance education are suggested. Rate: B.

- Art-23. Grimes, P. W., Nielsen, J. E., Niss, J. F., The Performance of Nonresident Students in the "Economics U\$A" Telecourse, The American Journal of Distance Education, Vol. 2, No.2, 1988

This course is structured around 28 half-hour video lessons covering macro and micro economics principles. Two nonresident distant learner groups and a control group of traditionally lectured students were compared. Pre and post testing measured three cognitive learning areas in economics. Attitudes were also measured. Findings about differences between telecourse and traditional students, as well as absolute and relative economic learning were reported. Attitude results were inconclusive regarding teacher/student contact effects. Rate: A.

- Art-24. Heinzen, T. E., Alberico, S. M., Using a Creativity Paradigm to Evaluate Teleconferencing, The American Journal of Distance Education, Vol. 4, No. 3, 1990

This study examined teleconference strengths/weaknesses according to the three components of the Amabile (1983)

model. Diverse teleconferences were studied by applying a pre-post test design and using items to evaluate effectiveness. A reaction survey was also administered. The instrument showed that teleconferencing appears to be an effective tool. However, participants were disappointed regarding its use as a problem solving tool. Statistics/graphic results support the findings. Rate: A.

- Art-25. Hesketh, B., Andrews, S., Chandler, P., Opinion-Training for Transferable Skills: The Role of Examples and Schema, University of New South Wales, Australia, Educational Training Technology International (ETTI), Vol. 26, No. 2, May 1989

The article focuses on the process of training, emphasizing the need for methods which aid transfer of training and the development of confidence/ability to engage in future learning. The functional importance of principles versus just procedures applications is explained. The role of examples related to principles and discovery approaches facilitative of schema development are discussed.

Research findings of Gick and Holyoak (1983), Fotheringham (1984), Kieras and Bovair (1984), Shea and Zimny (1983), Downs and Perry (1984), Hogan, Hakel, and Dicker (1986), as well as Kamouri are reviewed. Rate: A.

- Art-26. Holdampf, Barbara A., Innovative Associate Degree Nursing Program - Remote Area., Howard County Junior College District, Texas Education Agency, 1983.

Main campus versus videotaped lectures on a distance education basis for an associate degree nursing program were compared. No significant differences in test scores were found. The attrition rate for the distance program was much less than the main campus rate. Rate: A.

- Art-27. Holmberg, B., The Development of Distance Education Research, The American Journal of Distance Education, Vol. 1, No. 3, 1987

Early Monographs, articles, and bibliographies are cited. The importance of deductive methods rather than inductive methods of research is emphasized. About four pages of references are listed; great topics source. Rate: A.

- Art-28. Howard, D. C., Designing Learner Feedback in Distance Education, The American Journal of Distance Education, Vol. 1, No. 3, 1987

Feedback design is discussed in terms of functional value and instruction. Declarative and procedural knowledge as

components of information-processing models are explained. Components of inferential comprehension include integration, summarization and elaboration. A feedback design model is presented that includes four feedback aspects relating to cognitive demands of tasks. Feedback formats for specific courses depend on practice tasks assigned and contextual constraints. Rate: B.

- Art-29. Keene, S. D., Cary, J. S., Effectiveness of Distance Education Approach to U.S. Army Reserve Component Training, The American Journal of Distance Education, Vol. 4, No. 2, 1990

The study reports evaluation of an interactive video teleconferencing, computer teleconferencing, and audiographic teleconferencing "package" to deliver Reserve Component training. Background research for this study is reviewed. The course was Phase II of the Command and General Staff Officer's Course (CGSC), Non-Resident. One control and two experimental groups were studied. A multivariate analysis of variance procedure showed distance learning students achieved significantly higher scores on three of four outcome measures. Participants were not randomly assigned and relative technology contributions were not assessed. Rate: A.

- Art-30. Kember, D., Murphy, D., Siaw, I., Yuen, K. S., Towards a Causal Model of Student Progress in Distance Education: Research in Hong Kong, The American Journal of Distance Education, Vol. 5, No. 2, 1991

Kember made use of the Tinto (1975) model of student drop-outs for one relevant to distance education. The article presents a quantitative study, using data collected by the DESP questionnaire and links variables by path analysis. The questionnaire was administered to 1060 Hong Kong students enrolled in one of four distance education courses in Textiles and Clothing. Six background characteristics as independent variables, four intervening variables, and two persistence dependent variables were included in the path model. The four social and academic integration factors from the DESP survived second-order analysis. However, only academic incompatibility marginally correlated with grade point average ( $r = .24$ ). The authors do conclude that other unconsidered factors could have more substantial influence since the intervening variables have low coefficients. Rate: A.

- Art-31. Kinsey, Joanna, Teaching Marketing at a Distance, University of Strathclyde, Scotland, Management Education and Development, Vol. 17, 1986.

An MBA distance learning course in the United Kingdom was



reviewed. The review included: motivations to enroll, content areas, teaching methods, types of data collected, course values to students, and a favorable conclusion by the author. Rate: A.

- Art-32. Knapper, C., Lifelong Learning and Distance Education, The American Journal of Distance Education, Vol. 2, No.1, 1988

Faure's concept of lifelong learning is addressed, identifying four major system ideals. The author suggests that if distance educators accept lifelong learning as a primary goal, then there must be an increasing concern for four specific identified functions. Rate: B.

- Art-33. Koontz, F. R., Practices and Procedures in the Administration of ITV Distance Learning Programs, The College of Education and Allied Professions, The University of Toledo, 1989.

Telecourses were evaluated and compared to existing programs. but not relative to criteria other than texts, study guides and video lectures. Needs assessments were not predictive of program success. Marketing was the cause of success. Five out of six telecourses appeared to be cost effective. Rate: B.

- Art-34. Lane, C., A Selection Model and Pre-Adoption Evaluation Instrument for Video Programs, The American Journal of Distance Education, Vol. 3, No. 3, 1989

Existent media selection models have been found to be inadequate. A two-round Delphi approach was used to develop 57 final questions which were specified for nine question areas. The criteria may be used to evaluate multi-media, combinations of media, and factors related to courses. Rate: A.

- Art-35. Lasser, W., Bartels, J., Klein, H., and Rossie, U., Video As Supplementary Material - The Impact of an Alternative Development of Study Materials in Solving Formal Economic Problems, Queensland University, Brisbane, Australia, 1981.

Efficiency of video as an additional teaching aid for a statistics course was studied. Sixty-five distance and internal students were divided into five groups. Test groups did best. The groups were too small. Rate: B.

- Art-36. Lauzon, A. C., Moore A. B., A Fourth Generation Distance Education System: Integrating Computer-Assisted Learning and Computer Conferencing, The American Journal of Distance Education. Vol. 3, No. 1, 1989

The article pertains to Personalized System of Instruction (PSI), Computer-Assisted Learning (CAL), and Computer Conferencing (CC). Five components of PSI systems are specified. CAL enhances student participation and CC provides for asynchronous communication among course participants. The "fourth generation" of distance education is discussed and its characteristics are identified. PSI, CAL, and CC research is discussed. Rate: A.

- Art-37. Martin, H., Foreign Language Study by Correspondence: Who and Why?, The American Journal of Distance Education, Vol. 3, No. 2, 1989

This two page article provides a demographic data summary of 550 students enrolled in modern European language courses given by Wisconsin-Madison Extension. Results are tabulated in terms of response percentages. Rate: C.

- Art-38. McCleary, I. D., Egan, M. W., Program Design and Evaluation: Two-Way Interactive Television, The American Journal of Distance Education, Vol. 3, No. 1, 1989

A three course sequence was formatively evaluated where two-way interactive television for distance learning was used. Program development is described. Course descriptions are given. Measures for data analysis and procedures used are specified. Four categories of variables documented the development process. Results are provided both statistically and graphically. Rate: A.

- Art-39. Montler, J., Geroy, Gary D., A Model to Address Design Constraints of Training Delivered Via Satellite, Pennsylvania State University, 1988.

Constraints that need to be addressed to create an effective presentation are identified and a model was developed to guide personnel for delivery via satellite. A handbook was also developed as was a worksheet for analyzing training costs. If the topic is important to the reader's purposes, the Rate: A. Otherwise, for evaluation purposes, Rate: C.

- Art-40. Moore, George A. B., Asynchronous Electronic Communication: A North American-Thai Collaboration, The American Journal of Distance Ed., Vol. 2, No. 1, 1988

Five characteristics of distance education are identified. The article deals primarily with the use of technical media to join teacher and learner and two-way communications. A pilot project to test a micro computer-based self-testing system for remote learners in rural Thailand is described. Final exam scores were reported to be one letter grade higher than those in conventional classes. Frequent testing and immediate feedback were identified with the gain. Rate: A.

- Art-41. Phillips, A. F., Pease, P. S., Computer Conferencing and Education: Complementary or Contradictory Concepts?, The American Journal of Distance Ed., Vol. 1, No. 2, 1987

Seventeen of 26 baseline surveys addressed three primary research focus areas: educational environment evaluation, computer as a communications medium, and social dynamics/interactions. Principal survey findings about participant enrollment reasons and "intriguing issues" were discussed. Idea exchange and most interactions were good, while there was a need for better formal structure, faculty and equipment performance, and mechanisms to ensure involvement or participation. Rate: B.

- Art-42. Phillips, G. M., Santoro, G. M., Kuehn, S. A., The Use of Computer-Mediated Communication in Training Students in Group Problem-Solving and Decision-Making Techniques, The American Journal of Distance Ed., Vol. 2, No. 1, 1988

This article describes the development of a computer-assisted course in group performance skills (GPS) that makes use of computer-mediated communication (CMC). Four advantages of the CMC instruction mode and two problems in planning the GPS/CMC system are identified. SYMLOG, the system for the multiple Level Observation of Groups, was used to map behaviors within task groups for response reports in three categories. Other specific features and techniques are discussed. The authors conclude the system can be applied to any instruction program involving interactions. Rate: A.

- Art-43. Pugh, H. L., Parchman, S. W., Simpson, H., Field Survey of Videoteletraining Systems in Public Education, Industry, and the Military, Navy Personnel Research and Development Center, San Diego, CA, 1991

The objective of the project was to find more cost-effective ways to train Navy personnel in remote locations from instructional resources. A field survey of 13 sites using videoteletraining (VTT) to deliver remote-site instruction was conducted. Two of the 13 sites were military, one Army and one Navy. Army class data showed opinion ratings are slightly lower for VTT than for resident classes but grades on exams did not significantly differ. An evaluation at the Navy site indicated that differences between final grades of students at the remote site and the originating site are not "practically significant". Of the 13 sites surveyed, six sites reported positive attitudes and/or no significant grade difference results, while the remaining seven sites indicated no evaluation information was available. Rate: A.

- Art-44. Ritchie, H., Newby, T. J., Classroom Lecture/Discussion Versus Live Televised Instruction: A Comparison of Effects

on Student Performance, Attitude and Interaction, The American Journal of Distance Education, Vol. 3, No. 3, 1989

Although studies for three decades have shown student performance across instruction approaches are similar, comparison of interaction by instruction approaches may show differences. Twenty-six undergraduates were randomly assigned to three treatment groups. The instruction was a 13 minute English clauses lecture. After instruction a personal survey, performance test, and attitude survey were administered. Measures of interaction were coded from videotape recordings. The traditional group did not differ in achievement from either of the other two groups. Some measures of perception did differ. The authors suggest that interaction may affect course completion or future enrollments. Rate: A.

- Art-45. Romiszowski, A. J., Avoiding Failure Through Better Project Planning and Analysis: Case Studies of Avoidable Failure in Instructional Systems Design and Development Projects, Syracuse, University, NY, Educational and Training Technology International (ETTI), Vol. 26, No.2, May 1989

Three phases for analyzing the progress of project planning are identified. Good front end analysis helps to reduce project failures by going for right rather than wrong types of solutions. Time and cost constraint solutions are offered. Use of distance education methods for course training can help prevent teacher losses. Organized group environmental approaches with the use of radio/television are better for low-literacy, young children, and rural education knowledge levels, i.e., correspondence/home study delivery substitutes will cause dramatic dropout rates. Program equipment maintenance is a must. A model for successful project planning and maximum planning parameters are also suggested. Rate: B.

- Art-46. Rupinski, T. E., Stoloff, P. H., An Evaluation of Navy Video Teletraining (VTT), Center for Naval Analyses, Alexandria, VA, May 1990

Video Teletraining (VTT) delivered to Navy schools at four remote sites was compared to traditional training. The first six months of operation was evaluated. Course grade differences were small and failure rates were not significantly different either. Deficiencies were identified. Rate: A.

- Art-47. Sassone, P. G., Bercos, J., Litton Systems, Inc., Holmgren, ARI Fort Benning, GA, Training Extension Course Cost and Training Effectiveness Analysis Methodology, 1986.

Training Extension Course (TEC) lessons versus conventional instruction methods for combat arms subject areas were studied. TEC trained soldiers performed better. Cost-benefit analysis and methodologies are covered. The mathematical example is difficult for the average reader to follow. Rate: B.

- Art-48. Shale, D. G., Pacing in Distance Education: Something for Everyone?, The American Journal of Distance Education, Vol. 1, No. 2, 1987

Major issues about pacing were discussed. Reasons for pacing and associated mechanisms that might be applied were suggested. Rate: B.

- Art-49. Smith, Eric E., Interactive Video: An Examination of Use and Effectiveness, Journal of Instructional Development, Vol. 10, No. 2, 1987

Active participation in the instruction/learning process is key to interactive video value. A definition for interactive video is given. Video technology history is covered. Numerous studies evaluating interactive videodisc effectiveness are reviewed/summarized. Rate: A

- Art-50. Stoffel, J. A., Meeting the Needs of Distance Students: Feedback, Support, and Promptness., Lifelong Learning: An Omnibus of Practice and Research, Vol. 11, No. 3, 1987

Three-hundred eighty-eight women at Saint Mary-of-the Woods College were surveyed about their perceptions concerning their external degree course. Responses about feedback, prompt responses, and helpfulness accounted for 51 percent of the comments. Only 13 percent of the responses were negative. The study is relevant to patterning of instructor behavior to meet student needs. Rate: B.

- Art-51. Stone, H. R., Variations in Characteristics and Between On-Campus and Video-Based Off-Campus Engineering Graduate Students, University of Mass., Continuing Higher Education - Winter Issue, 1988.

The article summarizes studies comparing attributes of on and off campus engineering graduate video based programs. With noted exceptions, the data support the comparability of on and off campus student results. Traditional criteria predict on campus performance, while experience and motivation have more impact on the off campus student performance. Corporate limitations for real-time participation are identified. Drop out rate reduces from 50 percent to 10 percent for a change from an interactive video program to a non-interactive videotape system. Rate: A.

- Art-52. Stubbs, S. T., Burnham, B. R., An Instrument for Evaluating the Potential Effectiveness of Electronic Distance Education Systems, The American Journal of Distance Education, Vol. 4, No. 3, 1990

The article describes a procedure which can be used as a guide for device selection prior to making costly commitments relative to electronic distance education (EDE). Five critical dimensions of EDE are specified, used, and evaluated in the development of an instrument called the Potential Effectiveness Inventory (PEI). Mean rank scores were determined to order the importance for the above five critical dimensions. PEI is intended as a first step to help evaluate educational delivery systems. Rate: A.

- Art-53. Twarog, L., Pereszlenyi-Pinter, M., Telephone-Assisted Language Study at Ohio State University: A Report, Ohio State University, The Modern Language Journal, Vol. 72, 1988.

Two approaches to teaching or reteaching foreign languages were compared. Two questions: Is The Teacher-Assisted Mastery-Based Self-Paced Instruction (TAMBSPI) with telephone teacher assistance (TELE-TAMBSPI) an effective way to learn foreign language; How effective is it in helping regain lost competence. Arabic, Chinese, Japanese, and Russian were selected to test the first question, while French and Spanish were used to test the second. Motives for taking the course were identified. TELE-TAMBSPI students performed better than TAMBSPI students relative to question one. French reviewing students produced grades of 95.4 percent for French and 96 percent for Spanish. They were all satisfied with the rejuvenation program. If offered nationally, the costs would be reasonable. Rate: A.

- Art-54. Wagner, E. D., Reddy, N. L., Design Considerations in Selecting Teleconferencing for Instruction, The American Journal of Distance Education, Vol. 1, No. 3, 1987

Video teleconferencing is hailed as the instructional technology of choice for the future. Various models and approaches are described as related to instruction and message transmission. Learners may need to do/experience some new processes in order to learn them. Four conferencing modes are discussed. The author concludes with seven points of import relating to design-driven instructional teleconferencing decisions. Rate: B.

- Art-55. Whitlock, Q., Student Failure in Open Learning, Dean Associates, Sheffield, Educational and Training Technology International (ETTI), Vol. 26, No. 2, May 1989

Two failings of open learning courseware relative to developmental testing include: Sample size and unrepresentativeness of the learners. Good initial validation is emphasized as a necessity. Learning climate is affected by peer group attitude and expert expectations. The learner must be motivated for the specific course work. Knowledge and skills of learners relative to the course work must match. Rate: B.

Art-56. Whittington, H., Is Instructional Television Educationally Effective: A Research Review, The American Journal of Distance Education, Vol. 1, No. 1, 1987

This research review included over 100 documents. Major studies were grouped into telecourse studies with examples of experimental comparisons of telecourses with on-campus courses and live interactive television instruction results. Conclusions were: students taking courses via television achieve, in most cases, as well as those via traditional methods; and, effective instructional design is crucial to student achievement whether delivered by television or traditional means. Rate: A.

Art-57. Wilkinson, T. W., Sherman, T. M., Perceptions and Actions of Distance Educators on Academic Procrastination, The American Journal of Distance Education, Vol. 4, No. 3, 1990

Academic procrastination, needlessly postponing academic tasks, is a problem with many college students. Distance educators from 276 higher education telecommunication-based distance education programs in the United States were surveyed. Perceptual causes were identified. Numerous strategies to reduce academic procrastination were offered. Additional research to address the procrastination issue were suggested. Rate A.

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# Acronyms

<b>A</b>	
AC	(Army) active component/audio-conferencing
ARI	US Army Research Institute for the Behavioral and Social Sciences
ASU	Arizona State University
AT&T	American Telephone and Telegraph
<b>B</b>	
B.E.S.T.	Better Educational Systems through Telecommunications
<b>C</b>	
CAI	computer-assisted instruction
CAIV	computer-assisted interactive videodisc
CAL	computer-aided learning
CBT	computer-based training
CC	computer conferencing
CD-ROM	compact disc-read only memory
CDC	career development course
CENET	Corporate Educational Network
CGSC	Command and General Staff College
CMC	computer mediated communication
CMI	computer-managed instruction
CPB	Corporation for Public Broadcasting
<b>D</b>	
DESP	Distance Education Student Progress
DTIC	Defense Technical Information Center

<b>E</b>	
E-mail	electronic mail
EDE	electronic distance education
ERIC	Educational Resources Information Center
ETTI	Educational and Training Technology International
<b>F</b>	
FTP	Farm Training Program
<b>G</b>	
GED	General Equivalency Diploma
GPA	grade point average
GPS	group performance skills
<b>I</b>	
I-NET	Instructional Networking
IBM	International Business Machines
ISD	Instructional Systems Design
ISDN	Integrated Services Digital Network
ITFS	Instructional Television Fixed Service
ITV	instructional television/interactive television
IUC	International University Consortium
IVD	interactive videodisc
IVT	interactive videodisc technology
<b>L</b>	
LSI	Learning Style Inventory
<b>M</b>	
MBA	Master of Business Administration

<b>N</b>	
NCREL	Northcentral Regional Education Laboratory
NEWTEC	Northeast Wisconsin Telecommunications Education Consortium
NMSU	New Mexico State University
NTC	Northcentral Technical College
<b>P</b>	
PC	personal computer
PEI	Potential Effectiveness Inventory
PROFNET	Professional Networking
PSI	Personalized System of Instruction
PSSC	Public Service Satellite Consortium
<b>R</b>	
RC	(Army) reserve component
RIELC	Rotter's Internal-External Locus of Control Scale
RIT	Rochester Institute of Technology
ROPES	Retrieval, Orientation, Presentation, Encoding, and Sequence
<b>S</b>	
SAS	Statistical Analysis System
SEN	Satellite Education Network
SYMLOG	System for the Multiple Level Observation of Groups
<b>T</b>	
TAMBSPI	Teacher-Assisted Master, Based Self-Paced Instruction
TEC	Training Extension Course
TELE	Telephone version of TAMBSPI
TT	teletraining
TV	television
TUCE	Test of Understanding in College Economics

<b>U</b>	
UMA	University of Mid-America
<b>V</b>	
VT	video teleconferencing
VTT	video teletraining
<b>W</b>	
WCC	Waubonsee Community College
WICHE	Western Interstate Commission of Higher Education